

The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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Brown & Sharpe Mfg. Co.'s Foundry.

The engraving on the opposite page represents a plan of the new foundry recently occupied by the Brown & Sharpe Mfg. Co., of Providence, R. I. It also shows the general environment of the premises. Although not a stove foundry, it will be found interesting and suggestive to those in the stove business. In the construction and arrangement of this building, as well as in its general equipment, no care or expense has been spared to make it the very best for the purpose. After occupying the building, the Brown & Sharpe Mfg. Co. employed Mr. Edward Kirk, the well-known expert in foundry operations, to inspect the premises and suggest such improvements in detail as might seem desirable. From a description prepared by Mr. Kirk the following account of the new building is taken: The walls of the building are of brick up to the window sills. From this point upward framework is used. The roof covering is slate. The portions occupied as ware room, rattling room, &c., shown in the diagram, are two stories in height. Above this part the pattern and carpenter shops are located. The parts in which the annealing room, picking room and core ovens are situated are one story in height, covered with a flat tin roof. The molding room is 265 feet in length by 55 feet in width. It is lighted by 118 windows, each 10 feet 6 inches long and 4 feet 6 inches wide. A ventilator 235 feet in length by 24 feet in width is placed at the ridge of the roof. Unlike many foundries, the windows in this building have been as carefully fitted as those in other parts of the establishment. The sashes are hung with weights, and each window is provided with a curtain on spring rollers. The 152 windows which are located in the ventilator just mentioned are hung on pivots, and are operated by iron rods in sets of five. The inside of the roof and ventilator is lined with narrow matched ceiling boards. The brick and woodwork of the molding room, including the girders and roof timbers, are painted white. Ample light is thus afforded, making this building very cheerful in contrast with the gloom of many of the foundries in use throughout the land. The entire floor surface of the molding room is laid in cement upon a foundation of gravel, save only the gangway, indicated by the lines in the diagram. This is covered with iron plates. The advantage of the cement floor will be appreciated by all neat workmen. The room is heated by steam and is lighted with gas from a double row of burners over the gangway and by side burners for each bench. The side of the room opposite the cupolas is fitted with benches for bench molding, while the other side is arranged for floor molding. In front

of the cupolas are two large cranes for heavy work, the centers of which appear in the engraving. Near the middle of the room are placed two large fire-proof safes, in which valuable small patterns are placed as soon as the molder is through with his day's work. The character of much of the work executed by the company makes this precaution with patterns very necessary. The cupola room, which is on one side of the molding room, near the center of the shop, is 24 by 26 feet in size. In the front of this room and on the edge of the molding room stand two cupolas of the Mackenzie pattern, being a No. 2 and a No. 4. Back of the cupolas, as indicated in the sketch, are the water tanks, a stairway, cinder mill, elevator and entrance to the molder's washing and dressing rooms. Above the cupola room is the scaffold, which is 24 by 26 feet in size. The floor of this is of heavy boiler plate. The scaffold is provided with two scales for weighing stock. A No. 4 1/2 Baker blower for supplying the blast, and the machinery for the elevator, are also located here. The elevator noted on the diagram is for conveying castings, &c., between the two floors, and is at present used for hoisting iron to the scaffold, although this is not the plan which will be pursued when the improvements are fully completed. Our engraving represents a track leading from the cupola scaffold across to the iron yard at the rear of the foundry, which is on the same level. When everything is completed material will be conveyed to the cupola by this means. Convenient to

the molding floors and situated back of the cupolas is the washing and dressing room for the molder. In this room are provided ample accommodations for hanging coats, hats and such other clothing as is not in use during work hours. A porter has charge of the room, who keeps the doors locked between times. Ample accommodations are provided for washing by means of long troughs, indicated in the diagram. What would be considered a luxury by many, but which, in fact, is a real necessity, is a series of bath rooms provided with running water, in which the men may strip and wash at the close of a day's work. The location of these rooms is indicated upon the diagram. The core room is 39 feet 6 inches by 37 feet and has a cement floor like the molding room. It is fitted with core benches and a large core oven, with revolving shelves for small cores. An iron car is provided for large cores. The water-closets for the foundry operatives are at one end of this room. They are fitted up in a convenient manner

yard. It is high enough at the rear of the foundry to permit a railway connection with the machine shops through an arched passage indicated in the engraving.

The convenient arrangement of the yard and different rooms of the building makes the handling of the stock and castings an easy matter. Nothing is passed over the same ground or through the same room a second time. Castings which are produced in the molding room are first taken to the picking room, then to the rattling room, then to the finishing room, and from this department, by means of the railway mentioned, to the machine shops.

In concluding his description Mr. Kirk says: "This foundry, without an exception, is the finest and best arranged of any in the United States. It was built in 1879 and 1880, and was put in operation in October, 1880, under the supervision of Mr. G. A. McCall, a thoroughly practical man, formerly of Rochester, N. Y. No care or expense has

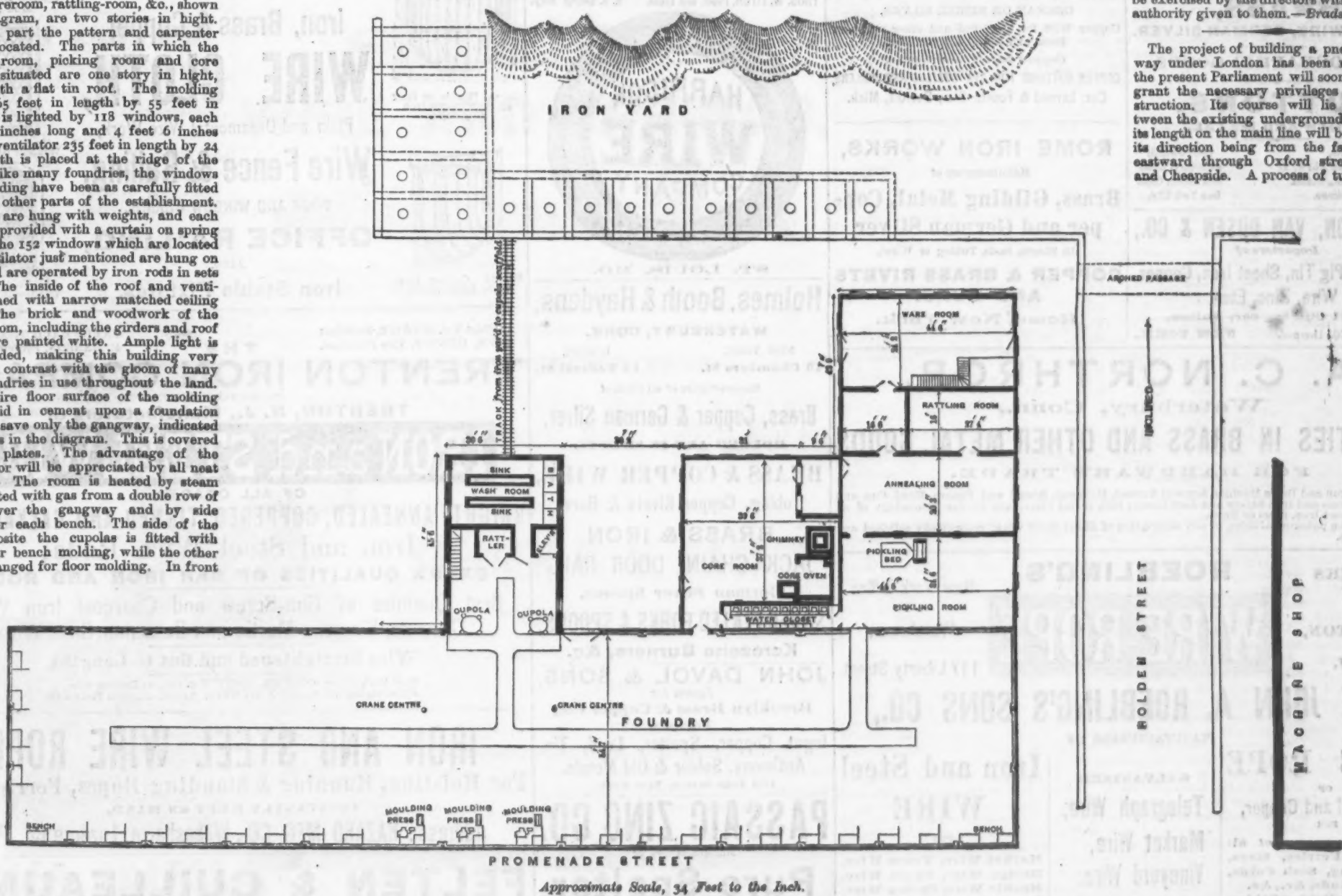
CHARGE IN A NO. 4 MACKENZIE CUPOLA IN THE FOUNDRY OF THE BROWN & SHARPE MFG. CO.

Coal.	Leigh No. 1.	Leigh No. 2.	Poughkeepsie No. 1.	Collieries No. 1.	Olant No. 1.	Scrap & Spence.	Total pounds.
1,100	1,000	1,000	1,000	1,000	1,000	1,000	8,000
445	300	300	300	300	300	400	2,000
400	300	300	300	300	300	400	2,000
300	300	300	300	300	300	400	2,000
300	300	300	300	300	300	400	2,000
2,225	1,300	1,300	1,300	1,300	1,300	1,600	14,900

Mr. Kirk says: "The first charge of 4000 pounds No. 2 and scrap was put in to test my chemical compound. The balance of the heat shows the regular mixture employed. The blast was put on at 3.45; the cupola stopped up at 3.58. The pressure of blast at this time was 6 ounces. Full blast was then put on and

conferred upon its representatives; but they are, nevertheless, the trustees for the stockholders. The general powers of the directors authorized them to conduct the ordinary business operations of the corporation, but not to effect a fundamental or organic change. The change proposed is not organic, but it is thorough and fundamental, as it affects the administration of the affairs of the company. It involves a withdrawal from the control and management of the stockholders of the entire property of the corporation for at least five years; it will preclude for a like period the exercise by the stockholders of their judgments as to the particular character and method of conducting the business affairs of the corporation, and it denies to the stockholders any right of suggestion or disapproval of the conditions when such a relinquishment of important facilities may be conceded. Surely, a power which will be attended by such consequences does not relate "to the ordinary business transactions," nor "to the orderly and proper administration of the affairs of the company," and hence cannot be exercised by the directors without express authority given to them.—Bradstreet's.

The project of building a pneumatic railway under London has been revived, and the present Parliament will soon be asked to grant the necessary privileges for its construction. Its course will lie midway between the existing underground roads, and its length on the main line will be 6 1/2 miles, its direction being from the far West End eastward through Oxford street, Holborn and Chancery. A process of tunneling will



PLAN OF THE FOUNDRY OF THE BROWN & SHARPE MANUFACTURING COMPANY, PROVIDENCE, R. I.

of the cupolas are two large cranes for heavy work, the centers of which appear in the engraving. Near the middle of the room are placed two large fire-proof safes, in which valuable small patterns are placed as soon as the molder is through with his day's work. The character of much of the work executed by the company makes this precaution with patterns very necessary.

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and are supplied with water from a large iron tank overhead. As a part of the system of this establishment, these closets are regularly cleaned and scrubbed and are at all times in perfect order.

The picking or cleaning room is 44 by 24 feet. In this room two large picking beds lined with sheet lead are placed, and at one end is a bench for chipping and finishing heavy castings. Next to this room is the annealing room, 54 feet long by 24 feet in width. Four small annealing ovens for use in light casting are employed. Next to the annealing room is the rattling or mill room, 16 by 27 feet in size. This room is furnished with four tumbling mills for cleaning and polishing castings after they have been picked and annealed. The finishing room is 44 feet long by 24 feet wide. Two ends and one side of this apartment are furnished with benches for chipping and finishing castings. In one corner is a small office for the use of the foreman and a clerk. Next to this, as will be seen by the engraving, is a stairway leading to the pattern and carpenter shops.

A special feature made possible by the peculiar location of this foundry is the situation of the iron yard already mentioned and the vaults or bins cut into the side hill, the locations of which are indicated upon the diagram. These vaults are built of masonry, and are used for storing sand, clay, coal, &c. Each is provided with a man-hole at the top for putting in material. The street which separates the foundry and the machine shop rises by an easy grade to the iron

been spared in equipping the works with the best patterns, flasks and fixtures. The working of the men has been thoroughly systematized, and everything is done with perfect regularity. No castings are made without a written order from the foreman of the different departments requiring them. These orders are all kept on file, and are recorded in the casting book. When castings are furnished, they are checked off with a memorandum of the date delivered, thus preventing all disputes about parts which are broken or lost. Everything moves without that "hurrah boy" style noticed in many foundries.

The cupolas are under the supervision of Mr. Finney, an experienced man in melting. As being of interest in this connection, we annex a report of some of the charges made under Mr. Kirk's supervision, with a memorandum of dimensions of the cupola employed. The length of the cupola at the bottom inside the lining is 49 inches and the width 38 inches. The length at the tuyere is 41 inches, and the width at the same point 28 inches. The length 2 inches above the tuyere is 42 inches, the width at the same point being 29 inches. The length 22 inches above the tuyere is 52 inches, and the width at the same point 39 inches. The height of tuyere above the iron bottom is 12 inches. The tuyere is continuous around the cupola and is 2 inches wide. The cupola, as already mentioned, is of the Mackenzie pattern, and blast is supplied from a No. 4 1/2 Baker blower. The charge was as follows with the results noted:

the pressure increased to 8 ounces. At 4.30 the pressure was 10 ounces; at 5 o'clock and 5.30, 14 ounces; at 5.42, 12 ounces and at 5.45 the bottom was dropped. The increased pressure of blast was caused by the clogging of the cupola and not by increasing the speed of blower."

Officers of Corporations and Their Powers.

A company was incorporated to "manufacture iron or steel, or both, or any other metal, or any article from metal or wood, or both," and a majority of the board of directors in December, 1881, had determined, before the annual election, which would be held on January 19, 1882, and against the protest of one of the stockholders, who held and owned a majority of the stock, to lease the whole property of the company for at least five years, and giving an option to the lessee to purchase the whole works at a fixed price. The stockholder filed a bill in equity for an injunction, in the United States Circuit Court, at Pittsburgh, Pa., to restrain this action of the directors, and they in their answer admitted the intention to make the lease, and averred that it would be for the benefit of the corporation. Judge McKennan, on December 27, granted a preliminary injunction, and in the opinion said: The directors and officers of a corporation are its exclusive executive agents, and, as it can only act by and through them, the powers vested in the corporation are deemed to be

be adopted, the line being far enough down to escape all sub-cellars and sewers, entering, in fact, into the London clay, which would require a depth of about 50 feet beneath the roadway and about 30 beneath the bed of the Serpentine in Hyde Park. By this means it is believed that every obstacle can be avoided, while no disturbance of the surface would take place, except where stations are to be built. Rarely would it be necessary to encroach on land belonging to private persons, the aim being to follow a line directly below the streets. This great depth passengers could easily reach by an elevator arrangement run by hydraulic power, which, in the completed work, would be abundant since the engines are to be worked by it. It is proposed that the tube shall be 12 1/2 feet by 10 1/2 in size, and that every section shall be finished and fitted to every other above ground, and then taken below and put in its place as excavation proceeds. The plan contemplates the employment of both compressed and exhausted air, they being used alternately, in order to secure a constant supply of fresh air and thorough ventilation through such a system of blowing and sucking. No difficulty is anticipated in thus propelling or drawing trains weighing 60 tons at the rate of 20 miles an hour. But the greatest boon the line would confer on men would be its excellent ventilation and absence of smoke, qualities for want of which the present underground roads have become intolerable nuisances, which it is a standing cause for wonder that the English people have so long endured.

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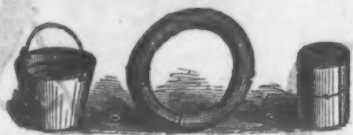
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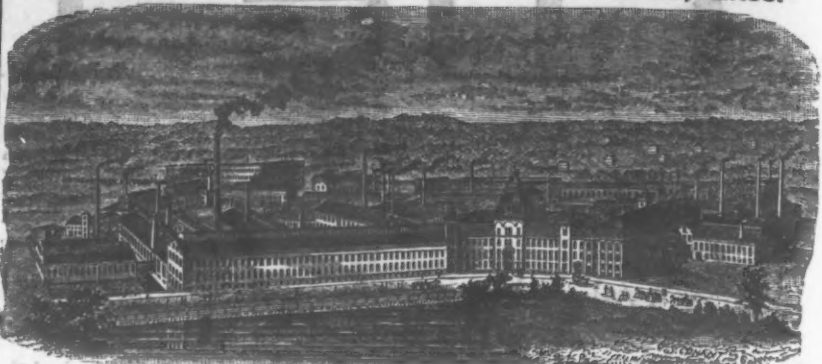
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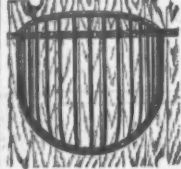
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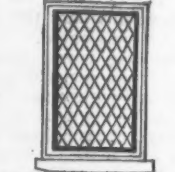
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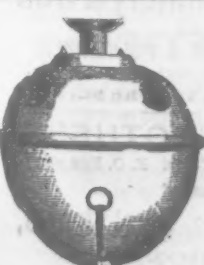
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Iron on the Pacific Coast.

The San Francisco Commercial Herald, in its annual review of business on the Pacific Coast, has the following:

The States of California, Oregon and Washington Territory have begun to feed this market freely from their inexhaustible mines. To illustrate this, we remark that the Placer County mine of the Clipper Gap Furnaces yielded 4260 tons pig iron last year; they have now on hand about 1900 tons. The furnaces are now temporarily closed. They will recommence melting in April next. They calculate their output in 1882 will average 800 tons monthly. The reported sale of the Oswego Furnaces to Henry Villard and his associates has not been confirmed. They figure their monthly yield for 1882 at 500 tons per month. They have a local sale for fully one-quarter of their production. J. W. Harrison's annual circular is a condensed review of the pig iron market of California for the past six years, classifying each year's consumption, stock, importations, &c., under separate headings, to facilitate the calculation of the relative bearings of each year. The past year has not been a very profitable one to importers, partially because the quantity imported has been so much less than preceding years, and partially because the selling price has favored the buyers during the first eight months of the year. The price of Glengarnock in January, 1881, was \$27 @ \$28; from April to August it ruled from \$25 @ \$26; and in September it advanced to \$28; now it is held at \$30, spot, and \$26.50 present loading. It would appear singular that the quantity of foreign iron imported should be so light, in view of the consumption being so large—nearly 3500 tons over that of 1880. Still this is explained by the fact that the Clipper Gap Furnaces in Placer County, and the Oswego Company's furnaces in Oregon combined, were expected to yield more than the consumption of California, which had averaged 14,400 tons per annum for the preceding five years. In addition to this we commenced the year 1881 with nearly 15,000 tons on hand; so importers, for prudential reasons, withheld ordering. It having been since ascertained that a certain quantity of soft Scotch is absolutely required to mix with our local product, orders have been more freely given, and there is at this date more Scotch iron en route than at this time last year.

is manufactured into pig. The immense iron beds owned by J. B. Potter, Avery, Governor Stanford and others, and situated near the McCloud River at the sight of the old Silverthorn bridge, and secured by Government title, are extensive enough to justify the employment of heavy capital in working them. Iron Mountain is known to contain countless millions of tons of the finest quality of iron ore, and our local blacksmiths have repeatedly heated specimens of it in their forges and hammered it into various implements.

As we are likely to draw heavily upon Oregon in the near future, it will be well to look at the iron industry of that State, as narrated in the Oregonian, being a brief sketch of the work now being done at the extensive plant of the Oswego Iron Works. The mining and manufacture of iron will be one of the greatest of the future industries of Oregon and Washington. Great deposits of this valuable metal are known to exist in many localities within their territory, and this fact, coupled with those of ample transportation facilities by water and rail, vast mines of coal for coke and fuel, and forests of timber for charcoal, must eventually cause the establishment of furnaces and manufacturing in large numbers as soon as they become known. There are few localities so abundantly favored by nature for the profitable development of this industry, and that it will in time become a field in which thousands of busy hands and millions of capital will be employed, is doubted by no one at all acquainted with the mineral wealth of this section of the Pacific coast. All baser metals are compelled to remain undeveloped where gold and silver are to be found, until either a population that is permanent have established themselves, or the richer metals have been comparatively exhausted. Then these deposited minerals will receive the attention they deserve, and not till then. Although several important deposits are known to exist in Oregon and Washington, but two companies are doing anything in the way of developing them. These are the Oswego Iron Works, located seven miles south of Portland, and the Irondale Iron Works, near Port Townsend, W. T. The latter has been established but a short time, and is operated by California capital. A furnace has been erected and some work done, but no figures have been ascertained as to the amount. The Oswego Iron Works have been established since 1866,

Year.	Lowest and Highest Prices.	Stock, Jan. 1.	Consumption.	Importations.	Stock Dec. 31.
	Per Ton.	Tons.	Tons.	Tons.	Tons.
1876.	\$31.00 @ \$34.00	White..... 2,704 Soft..... 9,446	White..... 2,820 Soft..... 16,499	White..... 2,631 Soft..... 20,504	4,119
1877.	\$18.00 @ \$22.50	White..... 1,915 Soft..... 13,541 Total..... 15,456	White..... 2,073 Soft..... 13,490 Total..... 15,563	White..... 3,355 Soft..... 14,117 Total..... 17,472	3,400
1878.	\$25.50 @ \$31.00	White..... 3,197 Soft..... 14,168 Total..... 17,365	White..... 2,509 Soft..... 11,533 Total..... 14,042	White..... 1,705 Soft..... 9,348 Total..... 11,053	2,600
1879.	\$24.00 @ \$34.00	White..... 2,393 Soft..... 11,977 Total..... 14,370	White..... 2,700 Soft..... 10,426 Total..... 13,126	White..... 428 Soft..... 8,932 Total..... 9,360	1,328
1880.	\$26.00 @ \$35.00	White..... 1,674 Soft..... 13,188 Total..... 14,862	White..... 976 Soft..... 10,773 Total..... 11,749	White..... 840 Soft..... 12,369 Total..... 13,209	2,086
1881.	\$24.50 @ \$30.00	White..... 315 Soft..... 7,060 Total..... 7,375	White..... 1,659 Soft..... 13,538 Total..... 15,197	White..... 300 Soft..... 8,300 Total..... 8,600	2,877
Average for the past six years.	\$26.87 1/2	White..... 1,933 Soft..... 11,713 Total..... 13,646	White..... 1,818 Soft..... 12,708 Total..... 14,526	White..... 1,543 Soft..... 12,874 Total..... 14,417	2,735

The present stock on hand consists of 315 tons white iron, and 7960 tons soft iron (4520 tons in importers', and 3440 in foundrymen's hands), in all 8275 tons, of which 3235 tons are Scotch, 400 Oregon, 1920 Clipper Gap, 580 Salisbury and 1825 varied New York brands.

The Placer Herald has this to say about chrome iron: "We learn from Major Houston, who has charge of the chrome mining now being carried on in this county, that they find the chrome iron belt very extensive. It crosses Placer, and on South into El Dorado, and then traces of it are found nearly to the Southern extremity of the State. He has already shipped 80 tons from Auburn depot to Boston, and has over 30 tons ready to be forwarded. At the mines, near Michigan Bluff, about 100 tons are out awaiting the wagons to haul it down. Some rich deposits have been opened up on Slate Creek, two miles southwest of Georgetown, in El Dorado county, and hauling from there was commenced last Tuesday. The Major hopes to send off at least 500 tons before the winter rains shall render the roads impassable for loaded teams. He has been shipping around the Horn, but to intercept the supply from England, which country has heretofore controlled the trade in this commodity, the next shipment will be sent by way of the Isthmus. The indications are that chrome mining in this county will soon become a very important industry."

The Shasta Courier has this item about the iron ore of Shasta: "Of all the undeveloped resources of this State none has been so entirely overlooked and neglected as the iron interests. It was not until recently that the least attention was paid to the subject, and even now, outside of a few local papers and one or two of the San Francisco dailies, the matter is not mentioned. Public attention, even in the counties where valuable deposits of iron are known to exist, has not attracted that investment of capital necessary to the development of the mines. Notwithstanding this indifference regarding what is sure to be one of the leading interests of the State in the near future, at least four of the mountain counties contain deposits of iron equal in quality to the richest ores of Pennsylvania and New York—Calaveras, Tuolumne, Placer and Shasta. In relation to the supply we cannot speak with any certainty as to other counties, but in Shasta all the indications lead to the belief that it is inexhaustible. Shasta alone, of the counties known to contain iron, produces the black oxide, or what is more popularly known as the magnetic ore; deposits in the others consist wholly of the hydrated oxide of iron, a quality of ore usually called brown hematite. The difference between the ores is that the magnetic is richer, and is usually made directly into wrought iron in forges, while the hematite

their first blast having been blown in on the 22d of August in that year. The plant of the Oswego company is located on the west bank of the Willamette River, the mine being three miles from the huge blast furnace, with which it is connected by railroad, over which the ore is carried by a train of six cars, each capable of holding five tons. The mine is well developed by tunnels, shafts and inclines, and yields an abundance of ore. The dangers arising from choke damp and other vitiated air are obviated by a hot-air furnace, pipes from which lead through all the galleries and afford a pure atmosphere to the miners employed there. The ore of the mine is brown hematite of an excellent variety, and yields 40 per cent. of pure metallic iron. The average daily output is 100 tons, all of which is shipped to Portland and California foundries for manufacture into various articles of utility. It is estimated that there is now in sight ore enough to last 50 years at the least calculation, taking into consideration the prospective growth of the country and consequent demand for pig iron. The limestone used as a flux in the furnace comes from Washington Territory, and the sand used from the Sandy River. About 150 Chinamen are employed in cutting and burning the wood into charcoal, and 50 white men are engaged in hauling it to the works. Some 300 men are employed about the mine and works altogether. The blast furnace is a large structure 42 feet in height, capable of turning out 20 tons of pig iron daily. The company completed one blast of 8000 tons during the past summer, and are now busy turning out another. The quality of the iron made at Oswego is considered superior to any other on the Pacific Coast, and equal to the best produced in the United States anywhere. The sales of the company for 1881 will reach a figure in the neighborhood of \$200,000. Next year, with its prospective increase in demand and better advantages for turning out ore, this amount will doubtless be much increased. From its first inception it continued in operation until April 8, 1869, during which time it produced 2395 tons. The furnace was then blown out and remained idle until March 13, 1874, when it was started up again and ran until September, 1876, during which period it produced 5075 tons of metal. The property was sold at sheriff's sale in September, 1877, to satisfy a judgment of creditors, to the Oswego Iron Company, the present proprietors. The latter again started the furnace in June, 1878, and ran until November of the same year, producing 1170 tons. In the following winter the furnace was remodeled and its size and capacity greatly increased. It was blown in again in October, 1879, and continued until the 1st of September of the year just ended, when

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**Chester Iron Co.'s Blue, Red and Hot
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Also celebrated "Brotherton" Ore.

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PIG IRON ENGLISH FIRE BRICK.
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Fine Light and Medium-Weight GRAY
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Offer for sale in large or small lots, quantities to
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SILVER GREY IRON A SPECIALTY.

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Sole agents Glasgow Iron Co. and Fine Iron Works
manufacturers of Muck Bar and all grades of Plate
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Toggles, Eye Bolts and Log Dogs.

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LOCOMOTIVE AND CAR WHEEL TIRES,
Manufactured from the celebrated OTIS STEEL
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STEEL
CALK
HORSE & MULE
SHOE.**

KEYSTONE HORSE SHOE CO.,
17th and Clearfield Sts., Philadelphia, Pa.
Manufacturers of the Keystone Patent Solid
Steel Calk Horse and Mule Shoes.
These Shoes are made of superior iron and steel,
completely finished and ready for cold shoeing;
have clip and solid steel calk. The shoes are
punched through at the proper angles and free
from burrs. Same number of Shoes per keg as in
kegs of unfinished shoes.

changes were again made, as mentioned
above. The company own several thousand
acres of land, and have an ample fluid for
any amount of development they may choose
to undertake. The close proximity of their
plant to a market and high value of the ore
produced will give it an advantage over fu-
ture works, and it will probably be the loca-
tion of a number of extensive suburban
iron industries within a very few years.
Some time ago the company constructed a
canal from the Tualatin River to Sucker
Lake, a distance of two miles, but notwith-
standing the excellent water supply, the
company intend to run the new air blast
next year with steam power. There are
several other iron beds in Oregon. Columbia
County is known to contain extensive de-
posits of ore of excellent quality, and other
sections have shown traces which, when fol-
lowed up, will doubtless result in the devel-
opment of large beds. The entire region
west of the Cascades, both in Oregon and
Washington, indicate the presence of iron
and coal in large quantities. The mineral
wealth of the region east of the Cascades is
little known, but it is probable that iron will
be found there in as ample quantity as in
other portions of the Northwest. The great
undeveloped section of Southeastern Oregon
is said to be full of mineral wealth, and
traces of iron are observable in many portions
of northern Grant County and the western
portion of Baker. The bog iron beds of
Thurston and Pierce Counties, of Washing-
ton Territory, are well known, and will prob-
ably be the next deposits developed. With
the extensive improvements now being car-
ried on by the great corporations established
in the last year or two, this is only a ques-
tion of time, which cannot be but brief.

Annual Product of Quicksilver.
The total production of quicksilver on the
Pacific Coast in 1881 was 58,635 flasks,
against 59,453 flasks in the previous year,
and the exports by sea in 1881 amounted to
35,269 flasks, valued at \$1,027,508. About
17,000 went to China in the year just ex-
pired, and 15,141 were exported to Mexico.
The San Francisco World remarks as follows:
The production during 1881 has not materi-
ally varied, compared with former years,
neither in California nor in Europe, say
about 60,000 flasks here and 50,000 in Eu-
rope. Stocks here are moderate, it being
the policy of our producers generally to meet
the demand under reasonable restrictions.
Probably our whole available stock is about
5000 flasks, while in London it was 24,000
on the 23d day of last November, according
to the statement of the agents of the Al-
maden Mine (Spain), the Rothschilds, they
holding 13,000 bottles and speculators 71,000
bottles. It is safe to say that this large
quantity has all accumulated during the past
six or seven years, and 10,000 to 20,000
flasks are now being added yearly, which
will give in London by the close of the pre-
sent year 100,000 flasks or over. Prices during
the year were tolerably steady at 37 cents to 38
cents, except on about the 26th of September,
when advances came from London of a sharp
advance there from £6. 5/ to £6. 10/ per
bottle, and a few days later to £6. 17/6 to
£7. The price here was advanced and car-
ried as high as 42 cents per pound, at
which sales were reported. It is, however,
to be noted that considerable quantities were
taken by speculators, they paying from 37
cents to 39 cents per pound. Subsequently
the price declined in London, and when the
semi-official statement was made of stocks
there on the 23d of November, the market
fairly collapsed and £6. 5/ to £6. 2/6 per
flask was the asking price, less 3 per cent.
Hence the price dropped to the old figures.
With an average production, both here and
in Europe, it is difficult to see how prices
can be permanently advanced, unless new
uses can be found for the article or valuable
bodies of silver-bearing ore be discovered in-
volving large consumption. As with silver
product, doubtless China would take all of-
fered at the same price, but as purchasers
for that country, both in silver and mercury,
are largely made as a means of investing
surplus wealth—another term for speculation
—no permanent relief would follow in the
matter of stocks of this article, and any ad-
vance in prices would be, at the best, only
 spasmodic. The producer here can hardly be
expected, after selling at moderate figures,
to hold his stock out of the market and aid
the London speculators to work off their
large stock at high figures. All indications
point to steadiness in price and moderate
figures.

The Overland and Cape Horn Routes.
—Traffic between the Atlantic seaboard and
the Pacific States continues rapidly to in-
crease. San Francisco papers have been
furnished with a statement of the gross
weight of commercial freight transported
over the Central Pacific Railroad and leased
lines, both East and West, as well as locally,
during the past two years, as follows:

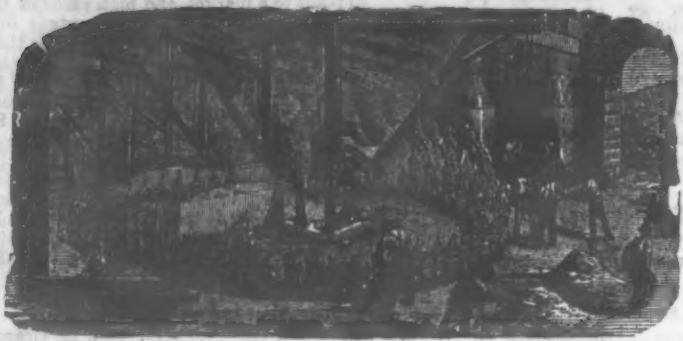
	1880.—Lbs.	1881.—Lbs.
East.....	227,850,100	253,935,400
West.....	230,849,200	235,025,100
Local.....	2,862,221,300	2,721,381,200
Totals.....	3,420,650,600	4,310,379,700

The comparison shows an increase of 919-
711,100 pounds, or nearly 27 per cent. The
local traffic has been greater than the gen-
eral business, and shows a gain of 30 per
cent. On the through freight traffic, the in-
crease is the largest on the east-bound
freight, which shows a gain of 16 per cent.,
against an increase of 8 per cent. on the
west-bound freight. These gains in quan-
tities probably represent the proportionate
increase in the values of the freight carried.
In addition to commercial business, the cars
carried 1,095,182,180 pounds freight for
account of the company. This gives a total
of 5,435,552,880 pounds freight carried from
five miles to 3000 miles in 1881, and this,
notwithstanding the extraordinary diversion
of grain transportation direct to Europe by
the ocean route. We observe that our local
owners of vessels going by Cape Horn cease
to dread the competition overland, feeling
assured that railroads built for the devel-
opment of the Pacific Coast will only enhance
the demands upon them for transportation.
This is indicated by the experience of the
past year, sixty-eight large sailing vessels
having been dispatched around the Cape,
comprising 104,747 tons register, against

A. H. McNEAL,

BURLINGTON, N. J.

Flange Pipes.



General Foundry Work.

CAST IRON PIPES

FOR WATER AND GAS.

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HAMMERED AND ROLLED

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Warranted Equal to any Produced.

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For Edge and Turning Tools, Taps, Dies, Drills, Punches, Shear-Knives, Cold-Chisels and Machinists' Tools generally.

SAW PLATES

For Circular, Holey, Mill, Gang, Drag, Pit and Cross-Cut Saws.

Sheet Steel

For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin Saws, Stamping Cold, &c., &c.

SIEMENS-MARTIN (Open-Hearth) PLATE STEEL

For Boilers, Fire-Boxes, Smoke Stacks, Tanks, &c.

All our Plate and Sheet Steel being rolled by a Patented Improvement is unequalled for surface and exactness of gauge.

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For Shafting, Spindles, Rollers, &c., &c.

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"Iron Center" Cast Plow Steel. Finished Rolling Plow Coulters with Patent Screw Hubs attached.
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"Solid Soft Center" Cast Plow Steel. Steel Forgings made to order.

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OF EVERY DESCRIPTION.



Tool, Machinery and Spring Steel Castings and Forgings.

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Of all Descriptions.

Address orders to

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For every kind of service, including Street, Mine and Lumber Tramways. Wheels furnished in rough bored or on axles. Chilled castings made to order.

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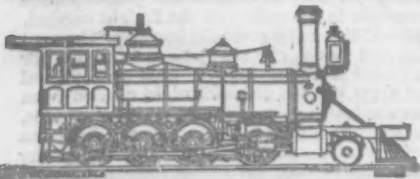
Steel Rails, Frogs, Crossings & Switches.

Forgings for Piston Rods, Guide Bars, Wrist Pins and Machinery Purposes.

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OLD & NEW IRON RAILS, AUSTRIAN CHARCOAL PIG IRON.

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Copper Ore, Mattes or Bullion purchased. Advances made on consignments for refining and sale. Smelting and Refining Works at Bergen Point, near New York. Offices, 292 Pearl St., New York.

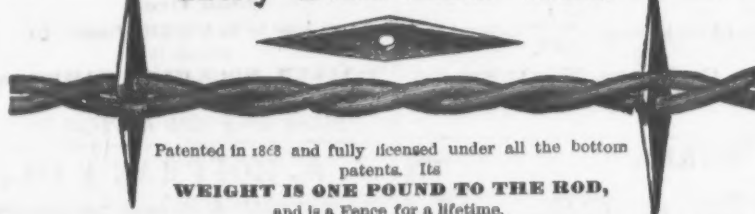
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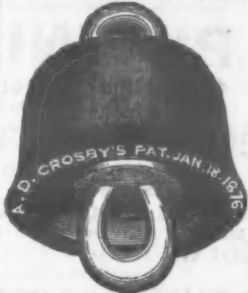
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We warrant our work for smoothness and finish.

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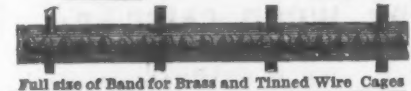
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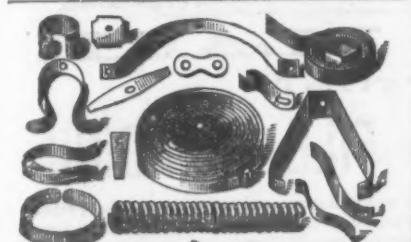


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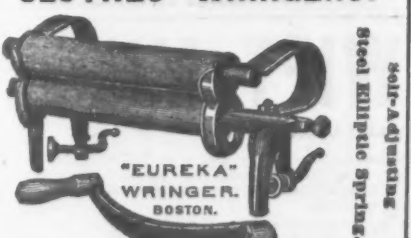
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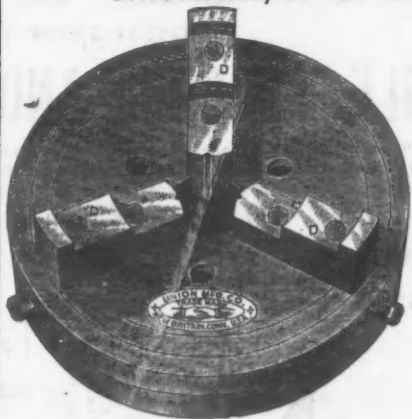
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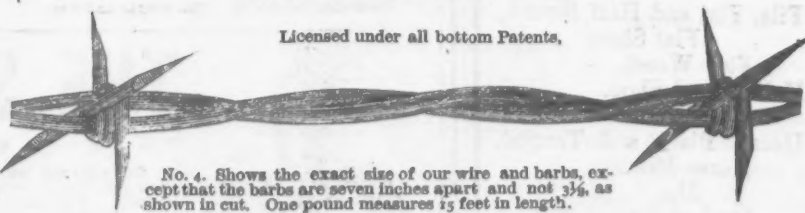
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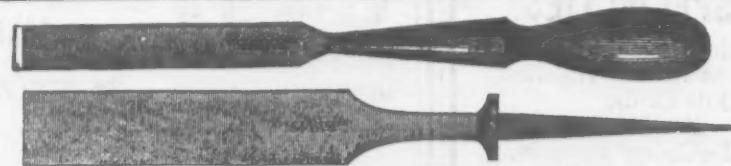
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BRIDGEWATER HORSE NAILS, 3d. FINE NAILS,
Tack Plates and Forgings of Every Description.

NAHUM STETSON, Jr., Agent, 73 Pearl Street, New York.

fifty-six vessels destined to California, sent around in 1880, amounting to 90,911 tons. Contrary to expectations, the opening of new railway routes overland through the Southwest, serve to increase rather than diminish the amount of merchandise transported by sea.

Tests of Metals.

The following is a report of the Committee on Tests, recently made to the Society of Engineers of Western Pennsylvania:

Sim: The Committee on Tests, in the absence of any original work which it is able to lay before the society, begs leave to submit the following statement of the affairs of the United States Commission for the testing of iron, steel and other metals.

In the year 1875, through the exertions of the American Society of Civil Engineers, the American Institute of Mining Engineers, the American Iron and Steel Association, and other scientific bodies, Congress created a commission to test iron, steel and other metals, and appropriated a sum of money for this purpose. The commission was composed of one engineer officer of the army, one officer of the Ordnance Department, two of the navy and three civil engineers, and began its labors very auspiciously. A number of tests were made in the Government testing machine at the Navy Yard in Washington, chiefly on chain cables, and a report was published, a copy of which is in possession of the library of the society. The chief fruit of the labors of the commission, however, is represented by the admirable testing machine at the Watertown Arsenal which it had built, but the use of which it never enjoyed. Even before its completion the funds of the Commission gave out, and all efforts to obtain additional appropriations from Congress proved futile, except so much as was necessary to pay for the machine. After its completion it passed into the hands of the Ordnance Department of the Army, and by law of Congress was made available to private individuals for purposes of tests on payment of costs. Extensive use has been made of this privilege, and the department has also been able to make a limited number of tests on its own account. Among these are the tests on lined and unlined cast-iron cylinders subjected to internal pressure, copies of a report on which was furnished the society through the kindness of Colonel Laidley, U. S. A., commanding Watertown Arsenal. Altogether a considerable number of tests have been made, and much information of value could no doubt be gathered from them, but very little has been published, and they as yet await the hand of some one who will work out the results systematically and give proper interpretation to them.

Your committee is happy to state that active steps have been taken by the American Society of Civil Engineers, aided by other societies, in effecting a reappointment of a commission and securing an appropriation from Congress. At the meeting of the American Institute of Mining Engineers in Washington next month, a united effort will be made to interest members of Congress in the subject and obtain favorable action during the present session of Congress. It is expected that the new commission will be placed on a better basis than its predecessor, that its powers will be greater, and that certain errors of organization which impaired the usefulness of the former commission will be avoided. There is every prospect that these efforts will meet with success, and the near future will see this, the most promising movement made in many years toward advancing our engineering knowledge, again under way and accomplishing results.

The committee regrets that one of its members, Mr. Kent, has been seriously ill for several months, and still continues so, in consequence of which his signature does not appear.

Respectfully submitted,
 C. L. STROBEL,
 J. W. WALKER,
 Members Committee on Tests.

Technical Schools for Artisans.—A long report on the question of instruction in the textile arts was presented at the annual meeting of the Textile Manufacturers' Association in Philadelphia, on the 31st ult. A year ago the organization decided to raise a fund for the establishment of a school of instruction, and since that time strong efforts have been put forth to secure a sum of \$25,000 for this purpose. Only \$20,400, however, has thus far been subscribed, and in deploring the apathy which exists concerning the subject, the report sketched the progress of technical education in Europe, and warned the listening manufacturers that in view of the action now being taken to place the workmen of Europe in a position to compete with other countries, it behooved them to awaken from their dream of fancied security and provide a system of practical education. The association directed that the report be printed for general distribution, and also resolved to call a public meeting at an early date in support of the movement. The report of the Treasurer showed that the receipts for the year had been \$4253, and the expenditure \$3686. It was stated that the project of establishing an exchange for the sale of wools and yarns had not proved satisfactory, but that the textile trade was steadily improving and that the output for the coming year would exceed that of any previous one. James Dolan was re-elected president, Wm. Arrott treasurer, and W. T. Seal secretary. The old Board of Managers was also re-elected.

Hawaiian Export Trade.—Following is an official statement of the quantities of leading staples exported from the Hawaiian Islands during the past two years:

	1881.	1882.
Sugar, pounds.....	63,284,000	92,393,000
Molasses, gallons.....	198,400	261,300
Paddy, pounds.....	6,469,800	6,702,500
Rice.....	99,500	18,900
Wool.....	381,300	528,500

The total value of all the domestic exports from the Hawaiian Islands for 1881 was \$6,530,300, against \$4,796,400 in 1880, an increase of \$1,733,900. The value last year is decidedly the largest in the history of the islands. This increased business is directly due to the reciprocity treaty. Of the sugar exported last year, 1,594,400 pounds was from Hilo, 9,781,800 pounds from Kahului and 81,016,900 pounds from Honolulu.

Lightning Conductors.

From the report of the Lightning-rod Conference recently held in England some useful hints may be gleaned. The rod at its summit, it appears, should be simply beveled, so that the full conducting power of the rod may be ready to receive a disruptive discharge, while at about a foot below the extreme top there should be firmly attached by screws and solder a copper ring carrying three or four copper needles six inches long, and tapering from 1/4 inch to as fine a point as can be made—the points to be plated, gilded or nickel-plated. These points are to induce the silent discharge, and thus, as it were, to prevent the difference between the electric potential of the cloud and the earth reaching such an amount as to cause the passage of a spark. Vases, finials and all pieces of metal work on the upper portions of edifices should be in metallic contact with the conductor. As to the relative advantages and disadvantages of iron and copper as material for the rods, the Conference decided that in all ordinary cases copper is the cheapest and best material. The minimum dimensions fixed are: Copper: Rope, 1/2 inch diameter; round rod, 3/4 inch; tape, 3/4 by 1/4 inch. Iron: Round rod, 9-10ths inch. The weight of the latter will be thirty-five ounces to the foot, whereas none of the copper conductors will exceed seven ounces. Especial stress is laid on the great importance of perfect joints, for it is essential that there should be no resistance whatever to the passage of the electricity. For this reason copper tape in which the joints can be easily made by riveting and imbedding the ends in a mass of solder finds most favor with the delegates. Of earthen plates, the report recommends that they should always be of the same metal as the rod, should have a surface of not less than 18 square feet (i. e., 9 on each side); and should be placed either in a well or in a hole so deep that the earth will never be dry. The plate need not be notched at the edges, but it should be covered with coke. Where it is impossible to find a perpetually moist earth, three or four hundred weight of iron should be buried at the foot of the conductor, and the hole filled up with coke when the earthen plate has been lowered in. To secure the moist state of the earth, rain water pipes should be led so as to discharge over the hole.

Color Relations of Metals.

In a paper on the color relations of copper, nickel, cobalt, iron, manganese and chromium, lately read before the Chemical Society, Mr. T. Bayley records some remarkable relations between solutions of these metals. It appears that iron, cobalt and copper form a natural color group, for, if solutions of their sulphates are mixed together in the proportions of 20 parts of copper, 7 of iron and 6 of cobalt, the resulting liquid is free from color, but is gray and partially opaque. It follows from this that a mixture of any two of these elements is complementary to the third if the above proportions are maintained. Thus a solution of cobalt (pink) is complementary to a mixture of iron and copper (bluish green); a solution of iron (yellow) to a mixture of copper and cobalt (violet); and a solution of copper (blue) to a mixture of iron and cobalt (red). But, as Mr. Bayley shows, a solution of copper is exactly complementary to the red reflection from copper, and a polished plate of this metal viewed through a solution of copper salt of a certain thickness is silver white. As a further consequence, it follows that a mixture of iron (7 parts) and cobalt (6 parts) is identical in color with a plate of copper. The resemblance is so striking that a silver platinum vessel covered to the proper depth with such a solution is indistinguishable from copper.


There is a curious fact regarding nickel also worthy of attention. This metal forms solutions which can be exactly simulated by a mixture of iron and copper solutions; but this mixture contains more iron than that which is complementary to cobalt. Nickel solutions are almost complementary to cobalt solutions, but they transmit an excess of yellow light. Now, the atomic weight of nickel is very nearly the mean of the atomic weight of iron and copper, but it is a little lower—that is, nearer to iron. There is thus a perfect analogy between the atomic weights and the color properties in this case. This analogy is even more general, for Mr. Bayley states that in the case of iron, cobalt and copper, the mean wave length of the light absorbed is proportional to the atomic weight. The specific chromatic power increases with the affinity of the metal for oxygen. Chromium forms three kinds of salts—pink salts, identical in color with the cobalt salts; blue salts, identical in color with copper salts; and green salts, complementary to the red salts. Manganese, in like manner, forms more than one kind of salt. The red salts of manganese are identical in color with the cobalt salts and with the red chromium salts. The salts of chromium and manganese, according to the author, are with difficulty attainable in a state of purity. He thinks these properties of the metals lead up to some very interesting considerations.—*Chemical Review.*


Rylands's Iron Trade Circular reports the condition of the blast furnaces of Great Britain at the close of 1881 as follows, compared with their condition at the close of the three preceding quarters:

Furnaces.	Dec. 31.	Sept. 30.	June 30.	Mar. 31.
Built.....	949	946	951	954
In blast.....	552	548	548	575

Bradstreet's reports state that it is said that the New York syndicate who hold the option to buy the stock of the Siemens-Anderson Steel Company, have made a proposition to the Merchants' and Manufacturers' Bank of Pittsburgh, as the chief creditor, to furnish money to operate the works. To secure the unsecured creditors, it is proposed to issue \$250,000 preferred stock at 6 per cent., the present mortgages to stand as they are, and secured creditors to hold on to their collateral and not use any force until the expiration of time agreed upon. There is said to be an action pending to have the proceeds of the sale of the works paid into court as divided among the creditors pro rata.

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Paris, 1878.

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F. K. Stibby, Emery Cloth.
Bedgwick Mfg. Co.,
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Bipley Mfg. Co., Mouse Traps.
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American Screw Co.,
Gimlet Pointed Screws, &c.
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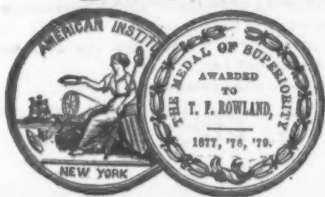
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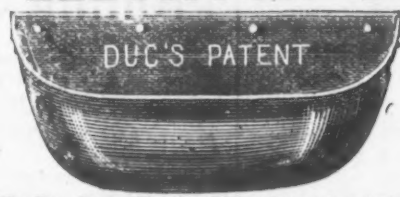
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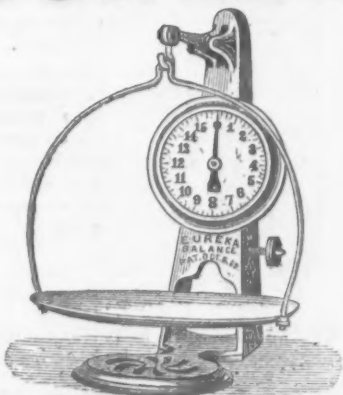
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Windsor Richards on the English and American Steel Trades.

At the recent annual dinner of the Cleveland Institution of Engineers, England, Mr. E. Windsor Richards, president of the institution, made the following remarks:

During the past year very substantial progress has been made in the manufacture of Bessemer steel from Cleveland ironstone, the molten metal being taken direct from the Cleveland and South Bank blast furnaces. The output of Cleveland steel by the Thomas-Gilchrist process at present exceeds 2100 tons per week from two pits. When it is remembered that such an output of ingots from hematite pig iron was only a few years ago considered fairly good work, it may be considered that the progress made is worthy of record. Improvements are now on hand which will shortly increase the production from two pits to 3000 tons weekly. The prejudice which very naturally existed against this steel is becoming more and more lessened, and will, no doubt, in the course of a couple of years completely die away—that is, if very special care is exercised by manufacturers in its production. It must be granted that extra precautions and more skill are required in this than in the old process of Bessemer steel making. It is an absolute necessity that the analytical chemist and the practical steel maker should work together, as every cast must be analyzed in order to ensure reliable results. So expert have the Eston chemists become that they can make a phosphorus determination and place the result in the steel maker's hands in an hour. The plan adopted at the outset of the process of making a small sample ingot of the partially-blown metal, hammering it flat under a steam hammer, cooling it quickly in water, breaking it in two, and then judging by the fracture (guided by previous analysis) whether the quality is right, and so determining whether any further and how much more blowing is required, is still found to be an excellent system. The Americans have not yet commenced making Bessemer steel from phosphoric pig iron, but are turning out enormous quantities of ordinary steel from hematite pig iron in the twenty-four converters now in operation. The average output of all the American steel works in November last was nearly 5400 tons per converter. In that month the justly celebrated works of Messrs. Carnegie Bros., managed by Capt. W. R. Jones, made 15,235 tons of ingots in two 8-ton converters with their vertical blowing engines, each engine having 42-inch steam cylinders and 56-inch air, 4-foot stroke, pressure of air 24 lbs. to 20 lbs. The men work eight-hour shifts, and at the time when I was at the works the heat was most oppressive. I saw the twenty-sixth blow turned up at 3 minutes to 4 o'clock in the evening, the shift having commenced at 8 in the morning and changing at 4 o'clock. Equally surprising is the output of ingots at the Bethlehem Works, managed by Mr. John Fritz. In the same month the make of ingots was 15,729 tons, made up from 8-ton converters, but with only one pair of horizontal condensing blowing engines, the steam cylinder being 36 inches in diameter, and the air cylinder 48 inches, 4 feet stroke, making about forty strokes per minute. There is a strong and healthy rivalry, with perfect good feeling, at these two works. Sometimes one is ahead; then the workmen of the other house look upon it as a personal matter, and make great efforts to obtain the largest output for the next month's record. These outputs are not what are termed "brag" records, but will be maintained and exceeded as soon as Capt. Jones has his new three 10-ton converters at work, and they may already be in operation. Mr. Fritz will not be behindhand as soon as his new large blowing engine is started. I have just received a statement of the output of ingots from the Edgar Thomson Works for the week ending December 3, 1881. As it is probably the largest quantity obtained from an American plant of two 8-ton converters, and as this year the three 10-ton converters will be in full operation, it will be interesting to note this output for future comparison. Commencing work on Sunday night, and finishing at 4 p. m. on Saturday, they made 496 casts, yielding 3813 tons of ingots; their best twenty-four hours' work was 700 tons. You will naturally ask why it is that England is so much behind in quantity? There are several reasons, but the chief one is that with such hurried work, which we term "driving," we could not fulfill the conditions of the exacting specifications of English and Continental engineers, and so requiring more time, we are compelled to do with four converters and four sets of men what the Americans do with two converters and three sets of men. It is found in practice that 33 per cent. more men will not work the third shift, but that 50 per cent. more are required, so that it is difficult to see the economy of working with such few appliances. I am of opinion that if any English firm having four converters making 3800 tons of ingots per week, stopped two of them, and worked two with three sets of men, and obtained the same output, the labor cost per ton of ingots would be quite as great with two converters as with four, leaving the matter of regularity of quality of product out of the question.

There are improvements and extensions in hand and contemplated in most of the American steel works. At South Chicago, on Lake Michigan shore, a completely new plant of the most modern description is almost ready for work; and in order that you may form an idea of what is being done in this direction on the other side of the Atlantic, a brief description of this plant may interest you. The plant consists of four blast furnaces, two of which are in operation. Each furnace is 75 feet high, 21 feet bosh and 9 feet hearth. The coke used is brought from Connellsville, near Pittsburgh, distant some 450 miles. The blast furnaces of the Chicago district were dumped down at the time of my visit, owing to the inability of the railway to deal with their enormously increased traffic. The ores, limestone and coke are stacked in a fine roofed shed, 367 feet 4 inches long by 98 feet 10 inches wide. To save something in cupolas (coke being very dear in Chicago), it is intended that the molten metal shall be taken direct to the converter from the blast furnaces. So far,

in America, their attempts in this direction have failed, owing to the inequality of the metal produced. There are 14 Whitwell fire-brick stoves, 60 feet high, 31 feet diameter; 8 vertical condensing blowing engines, with 84-inch air cylinders, 36-inch steam, 54-inch stroke, 30 to 35 strokes per minute; separate condensers; 36 boilers, 4 feet diameter, 72 feet long, cut into two lengths of 36 feet, making 72 boilers 36 feet long; all placed under a roof, 248 feet long by 96 feet span. The converting house is some couple of hundred yards away from the blast furnaces, and consists of three 10-ton converters placed side by side. The blast is to be supplied by a horizontal engine having 54-inch steam and 60-inch air cylinders. The ingots are to be taken while still hot to the rolling mills, heated in four Siemens gas furnaces, then rolled in a three-high roughing train, driven by a single-cylinder engine with heavy wheel. A finishing two-high train, driven by a pair of reversing engines, is placed directly in front and about 120 feet away from the last groove of the roughing rolls, in order that the ingot may be rolled at one heat into three 30-foot rails. This is an experiment in American practice, as in no works there do they roll more than one 30-foot length rail. The saws, hot benches, straightening and drilling machines, and gas producers are all in good substantial buildings, well roofed in.

There is nothing very striking in American rail-rolling practice. The rail trains are all three-high, and work well and do good work. They are driven some by vertical and some by horizontal direct-acting engines with cylinders from 40 to 46 inches diameter, stroke from 4 to 5 feet, with heavy fly-wheel's about 30 feet diameter. The rolls are about 23-inch pitch. The blooms are about 7 inches square, and rolled in eleven passes to a simple length of 56 pounds or 60 pounds of flange rail, 30 feet long. The two saws are fixed to that distance, and cut off both ends at the same time. If there is a bad end it is afterward cut off when cold, by a disk of soft iron without teeth $\frac{1}{4}$ inch thick, driven at 2200 revolutions per minute, and will cut through a steel flange rail in $1\frac{1}{2}$ minutes. If we consider the blast-furnace practice of America generally, and compare it with Cleveland, I have no doubt Cleveland is still in advance; but a few ironmasters, profiting by our as well as by their own experience, have effected great improvements during the last two years, particularly at Carnegie Brothers' Works, near Pittsburgh, the Cambria Iron Company, and a few others. Messrs. Carnegie Brothers have shown great foresight and enterprise in this direction. Their "C" furnace is 80 feet high, 20 feet bosh, 11 feet hearth, has eight tuyeres, 6-inch nozzles, 9 pounds pillar of blast, three Cowper stoves 60 feet high, 20 feet diameter, blast 1100". With such driving the life of the lining of the furnace must necessarily be short, probably never exceeding three years; but it is a merry life with pig iron at \$28 per ton. Indeed, so satisfactory is the result to the owners that they have erected, and by this time have most probably put in blast two more furnaces, "D" and "G," which are expected to produce even more surprising results than furnace "C." By the kindness of Mr. Andrew Carnegie, I shall be able to lay before you plans and description of this new plant at the next month's meeting of the institution. They are sent, at my request, specially for the Cleveland engineers. There are several novel points in the construction of their blast furnaces. I purpose calling your attention to them, and inviting discussion.

The difficulty of obtaining a solid ingot of steel, especially of soft steel, still exercises the minds of steel makers, though many are unaware of the extent of the cavities in the ingots they produce. If manufacturers would occasionally cut some ingots through the middle from end to end, they would be surprised at the results sometimes revealed. At the last meeting of the Iron and Steel Institute, Mr. W. D. Allen, of Sheffield, called attention to the action of a mechanical agitator for liberating the occluded gases in molten steel, and by his permission I saw the action of the agitator on a ladleful of molten steel. Directly the stirrer began to revolve there was a quantity of gas liberated, which burned with a bright flame. The steel was certainly very quiet in the molds. The beneficial effect of this liberation of gas is best appreciated when the steel is afterward drawn into fine wire.

The shipbuilding industry has attained immense proportions in the North of England and on the Clyde. It is very satisfactory to us in Cleveland to know that the River Tees increased in tonnage eighty-five per cent. last year over 1880. It is estimated that the tonnage built in Great Britain in 1881 amounted to about 1,000,000 tons. On the Clyde the tonnage of steel ships was 66,000 tons, as against 42,000 tons in 1880, and 18,000 tons in 1879. At the present time there are 50,000 tons of steel ships building on the Clyde. Our shipbuilding friends tell us that before steel can be very largely introduced or displace iron its price must be brought nearer to that of iron; and as Cleveland will become as large a steel making as it is now an iron making district, it behooves us to inquire into this matter. There are two points in the manufacture of steel plates for shipbuilding purposes beset with difficulty in contending with iron in price. First, the extra cost incurred by Lloyd's restrictions and tests, and, secondly, in the great loss by scrap shearings. Lloyd's exact that steel ships must be built under special survey; that tests shall be applied at the steel works under the personal and constant attendance of the society's surveyors, who are to have every facility placed in their way. The tests on strips cut lengthwise or crosswise of the plate shall bear an ultimate tensile strength of thirty-one tons per square inch of section, with an elongation equal to at least sixteen per cent. on a length of eight inches before fracture. Also strips are to be heated to a low cherry red, and cooled in water of 82° F. and stand bending double round a curve of which the diameter is not more than three times the thickness of the plate tested. In addition to this, angle bars are to be subjected to a cold test by being bent flat, and then doubled backward. When in crossing the Atlantic you find yourself in a thick fog on the Newfoundland Banks, with no slackening of the speed of the engine,

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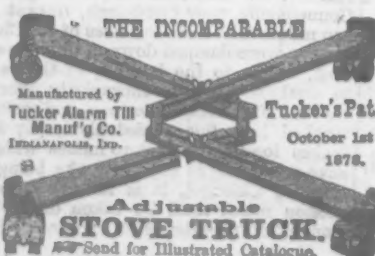
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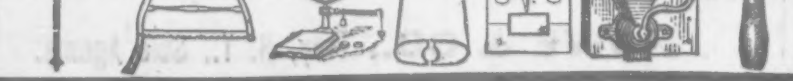
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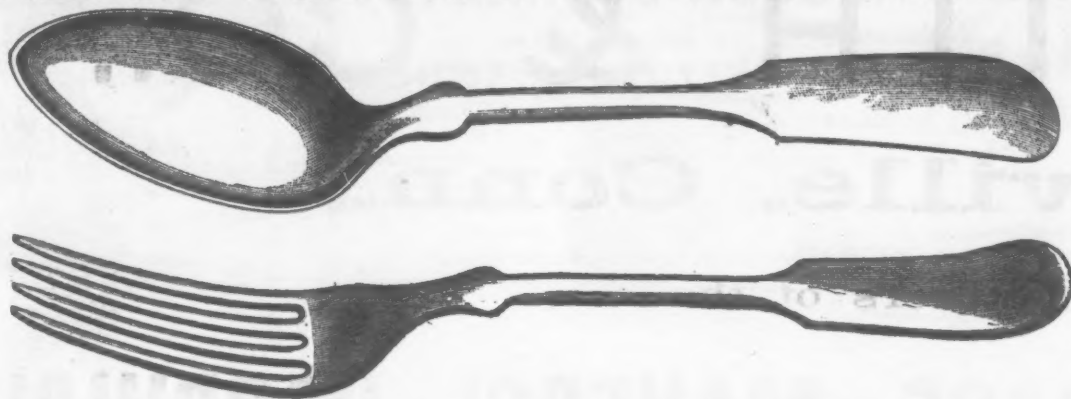
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gins, when the temperature of the water falls somewhat suddenly from 45° to 35°, and the chances are that at any moment the ship may ram an iceberg, there is a strong feeling of confidence engendered in being in a ship so carefully built and of such splendid material; but why an iron ship should be run under the same dangerous conditions, and built subject to no such restrictions and tests seems anomalous. It is, however, one substantial reason why steel for ships should cost more than iron for the same purpose. The second point is that scrap shearing made from iron plates which amount to nearly 50 per cent. on the plates sent from the works, can be easily repiled and rolled into plates, at the same time improving the strength of the plate; but, it is not so with ingot metal. The steel shear scrap, reduced almost to the value of pig iron, must be thrown back into the Siemens furnace or Bessemer converter. To reduce this cost of scrap plates of very much larger dimensions must be rolled, but to further reduce cost there must be no previous hammering, but this necessitates a large outlay on very ponderous and special machinery; but with such machinery plates in steel could be rolled two or three times heavier than are now rolled in iron, and so reduce the scrap by about 50 or 75 per cent. Some steel makers assert that it is impossible to roll an ingot into a clear surface plate without first hammering, as the hammer moves the rough scales, and clogging does not. Doubting this, I was pleased to see at the Otis Steel Works, Ohio, several Siemens' mild steel plates made from pig and scrap rolled at one heat into clean-surface boiler plates without any previous hammering. The ingot was 24 inches wide by 9 inches thick. The ingot is well and carefully heated in a Siemens' furnace, and rolled in a three-high Lauth mill, having 36-inch top and bottom rolls, with 20-inch center roll 9 feet 4 inches long, and making 90 revolutions per minute, driven direct by a single-cylinder Porter-Allen engine, 40 inches diameter by 4 feet stroke, with very heavy fly-wheel. To obtain clean surfaces they sweep the plate with steel-wire brushes dipped in water, and when the plate is about half-rolled numerous jets of steam are directed at an angle on to the surface of the plate, and are very effective in removing scale. In engineering matters connected with iron manufacture I noticed at the Pennsylvania Steel Works, Harrisburgh, a novel plan of erecting the casings of fire-brick, hot-air and wrought iron chimneys. Two new blast furnaces are being erected there, with six Whitwell stoves, 18 feet diameter, 60 feet high. Instead of putting the bottom plates of the stove together on the ground, and building the rings up from bottom to top, they commence with the top plates and top ring of the stove. They are first erected on the ground, and riveted and caulked complete; then, with three very large screw-jacks, having a lift of about 6 feet, and placed at equal distances round the site of the stove, worked by men with winch handles, this first ring is carefully and evenly lifted high enough to enable the workmen to put on the next ring of the plates 5 feet high. This ring is also riveted and caulked complete; then another ring is added and lifted, and so on, till the whole stove is completed. The wrought-iron chimney, 175 feet high, for working these stoves was erected in the same way. As fire-brick stoves are becoming general, this mode of erecting them may be found economical and convenient.

America is in a state of general prosperity; the railways along which I traveled were glutted with traffic. The iron and steel works, engineering and rolling-stock establishments were in full operation. Just a few instances: I visited the celebrated Baldwin Locomotive Works, in Philadelphia. One of the proprietors informed me that they were full of work up to 1883; a particular friend, who always gave them his orders, called and begged for one locomotive. The reply was that he could have it at an advance of 50 per cent in price, to which there was no demur, but it was a question of quick delivery. It was found to be impossible to deliver this one extra engine till June, 1882, although this firm turned out 11 locomotives per week. At the South Chicago new steel works the reversing rolling-mill engines were to have been delivered last March, but there was small hope of receiving them till the end of the year. At the new steel works at Scranton the cogging and rolling-mill engines are being made in England by Davy Brothers, of Sheffield. There is nothing more unsatisfactory to Americans than to be obliged to send out of the country for anything. The secretary of one of the leading iron associations told me that, though they could easily raise their prices all round if they chose to do so, they would not for fear of letting in foreign iron. Now, many of us no doubt think and say what a sad thing this protection is for the general interests of a great country, making a few rich at the cost of the many; but individual interests overcome these abstract ideas for the general good, and though we may all be sound free traders, there is not an ironmaster present who would not instantly become a staunch protectionist if his works could be transplanted to American soil. From all I have been able to gather a good year's trade for America is assured; and I believe in spite of all their best efforts—and great efforts are being made to supply their own wants—they must have some Cleveland pig iron and hematite Bessemer iron. They cannot do without it.

With the certain prospect of at least one year's better trade, I sincerely trust that the good relations now established between employers and employed in Cleveland will be maintained, and that the agreements made for carrying on uninterrupted work will be loyally and honestly carried out, so that both may reap the benefit of improved trade, and be to some extent recompensed for the miseries of a long period of trade depression; and that should disputes from any cause arise in this district, the old, cruel and barbarous system of settling them by strikes and lock-outs may be found to have become things of the past, and that common sense and reason will prevail. Finally, I appeal to the Cleveland engineers to forward the interests of their Institute by a better attendance at its meetings, and to read short papers on engineering, metallurgical, and chemical questions, in order that discussions may arise, and so give life and interest to our proceedings.

ings; and now, though rather late, I wish you, one and all, most heartily a most happy and prosperous new year.

INDUSTRIAL ITEMS.

MAINE.

The new branch railroad to run from Milo depot to Katahdin Iron Works, is in working order to Brownville village, and the work is progressing with the expectation of completing the road to the iron works in the spring. The production of iron at the works is fifteen or more tons per day.

The Pattle Governor Company has been organized at Portland, for manufacturing, using and selling the Pattle steam engine governor, with a capital of \$50,000.

VERMONT.

The works of the National Horse Shoe Nail Company, at Vergennes, were burned on the afternoon of the 9th. The rolling mill and workshops were entirely destroyed. The loss is estimated at from \$20,000 to \$25,000.

MASSACHUSETTS.

The Pittsfield Iron and Steel Company, organized in 1881, at Boston, have erected and almost completed large works at Pittsfield, for the purpose of manufacturing iron on an extensive scale. With regard to the quality of the ore it is, according to analytical tests, especially adapted for the manufacture of the finest quality of steel. The company are now busily engaged in putting up eight fires for making charcoal blooms.

There have been shipped from the Taunton Iron Works Co. during the past eight months 6320 stoves, ranges and furnaces. Orders for several kinds of ranges are coming in faster than they can be filled, which is a remarkable state of business for this time of year, when stove foundries are either stopped or are storing all they make.

It is said the profits of the Taunton Locomotive Company for the past year will be about double that of any former year for some time, and will equal about 75 per cent. of their capital stock. Certain it is that this establishment is turning out an immense amount of work, and also that they get nearly twice as much for a locomotive to-day as they did a year ago.

The Washburn Iron Company, at Worcester, whose work has heretofore consisted in the re-rolling and preparing of old rails, have lately determined on an entirely new departure, and have about completed extensive alterations and improvements in their machinery for the nearly exclusive manufacture of rails from Bessemer steel blooms. There are five buildings in all, including two foundries, a rolling mill, offices and pattern shop. The new machinery for the rolling mill and foundries consists of a Corliss horizontal engine and a full 22-inch rail train of rolls, with all the necessary details and appurtenances. The engine is about 500-horse power, with a 5-foot stroke and 34-inch cylinder. The fly-wheel is 25 feet in diameter, 15 feet face, and weighs 31 tons. It is intended to be run at the rate of 75 to 80 revolutions a minute. The engine and roller have been sunk to a depth of 17 feet. The company run 8 furnaces, with ten boilers 50 horse-power each, furnishing a capacity for turning out 100 tons, or 450 finished rails, per day. In the heating process, as carried on here, perfect rails are secured by the use of natural draft, in place of the ordinary system of artificial blowing, the heat in this case being permitted to enter the whole of the metal at once, instead of furnishing a greater heat for the outer surface. The company have lately added to their facilities in the matter of illumination by placing in their rolling mill one of Fuller's three-light electric machines. The new train of rolls is from the works of the Birmingham (Conn.) Foundry Company, and is guaranteed by them to be as perfect as any ever manufactured. The final details of the arrangements and setting up of the new machinery will be completed before the first of March, when the company will be fully supplied with all the requisites for their business and prepared to fill orders. The standard proportion of the rails to be manufactured by the Washburn Iron Company will be 30 feet long and 60 pounds to the yard, although they will manufacture as high as 72 pounds to the yard.

At Indian Orchard, the Chapman Valve Company intend to make important additions to their works in the spring. The building will be 100 by 50 feet, and three stories high, with a tower 18 x 20 feet, in which a power elevator will be placed.

The Greenfield Tool Company, Greenfield, was incorporated under the laws of the State of Massachusetts, in the year 1851, for the purpose of manufacturing joiners' bench and molding planes in every variety. In this branch of manufacturing they were very successful. A few years ago they began manufacturing ox shoes with patent dies, which found ready sale and demand far beyond their expectations. More recently they added table cutters to their product, and in this they also succeeded in gaining a reputation for superior workmanship. In August last the management changed hands, Mr. A. Alford, who for the past fourteen years has been connected with the extensive manufacturing corporation of E. Remington & Sons, New York, becoming its president, with the general management of its affairs. Mr. S. S. Ward, formerly a successful merchant in Texas, with an office in New York, has the entire management of the details of the manufactory. The company is now doing well, having orders ahead in all branches, including several thousand gross of table cutters, several thousand planes and more than twenty tons of ox shoes. They have just added an annex in the shape of a corrugated iron building for a drop-press shop, in which an additional heavy drop has been placed, making three in operation on ox shoes. The entire product of the company is taken by the firm of Alford, Ward, Davenport & Co., 77 Chambers street, New York. Messrs. Alford and Ward, of this firm, are the president and treasurer of the company.

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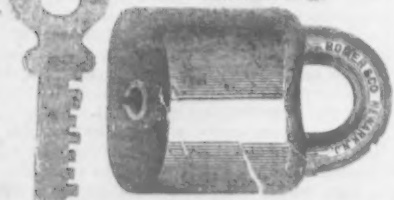
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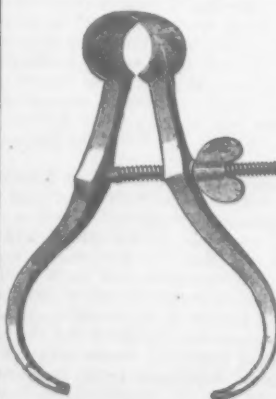
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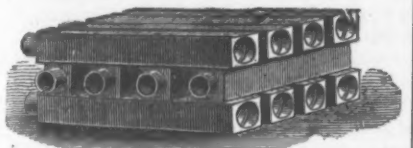
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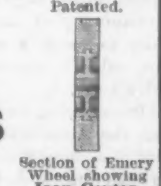


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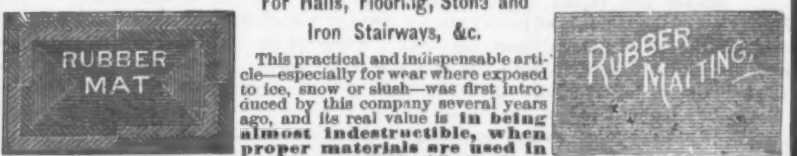
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This Packing is made in lengths of about 20 feet, and of all sizes from 1/4 to 2 inches square.

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capacity to turn out all the work on hand. The Lyman-Haskell gun is still undergoing the process of boring at the rate of three-quarters of an inch an hour, and the work is being done day and night. The first bore is 9 inches in diameter, and such is the accuracy with which it is done that after it had been cut to the depth of 4 feet 7 inches the drill was 1-32 inch out of plumb. The boring is being done with four cutters and a drill. Four vertical engines have also just been completed at the Scott Foundry, and two of them have been shipped away to the parties for whom they were made. They each have a 10-inch bore and a 12-inch stroke. A horizontal engine, with a slide valve, and having a 25-inch bore and 48-inch stroke, has just been turned out for Joseph L. Bailey & Co., at the Pine Iron Works. One rotary shears, and a pair of muck-bar shears have just been finished and shipped to the York Rolling Mill. There are also three cotton presses under way.

The entire 200 ovens of the Connells-ville Gas Coal Company are now in operation, and the company are shipping twenty-five cars of coke per day, employing 140 men. The entire plant of the company contemplates 400 ovens. The present number will be increased by seventy-five more in the spring.

The West Hamburg Iron Works are making important improvements. The lessees, Messrs. Navegold, Scheide & Co., are erecting several new furnaces, and contemplate purchasing a squeezer. It is also stated that the company will arrange to resume the manufacture of merchant bar iron, which portion of the works have been laying idle since last September.

The old locomotive works in New Haven, opposite Connellsville, which have lain idle for several years, are expected to restart in the near future. The real estate is owned by the National Bank of Commerce of Pittsburgh, and part of the machinery by B. K. Hyndman and others. The gentlemen about to purchase all reside in Pittsburgh.

Maidencreek Furnace is almost in repair again, and will probably blow in the latter part of this week.

The Scottsdale Tribune of last week says: "One of the hot-blast furnaces at Charlotte Furnace is being overhauled and repaired this week. It will require two or three weeks to put it in working order. In the meantime the other furnaces will perform the duty of this one in addition to their own, and a stoppage of the furnace will not be necessary."

The Lehigh Zinc and Iron Company, Limited, are again opening their spelter furnaces, which have been shut down since the old Lehigh Zinc Company ceased to operate. The new spiegel furnace recently erected will soon be in operation by the new zinc company. The manufacture of oxide of zinc is extensively carried on, and ere long the zinc works will again be more prosperous than they have been for ten or fifteen years.

Ten stove molders who have been employed at the works of Shantz & Kaeley, Spring City, desire to form an association and go into the stove business for themselves. Their capital, the savings of their industry, is sufficient to run the works according to their plans, but not to buy the ground and erect the necessary building. They hope to find some capitalist willing to build and lease them a suitable structure in Norristown. No definite arrangement has yet been reached.

Notwithstanding the Pennsylvania Railroad Company, in their last annual statement, reported their ownership of about one thousand locomotives, and have since that time built over one hundred more at their own shops, the company are badly pressed at present for locomotive service. The Baldwin Works can furnish none until September next, being pressed with previous contracts, and the first cost and added duties make it too costly to import them. Proposals for the construction of fifty new engines have been invited recently, and will be acted upon in a few days. Meanwhile the shops at Altoona are being rushed with work, and their facilities are being enlarged, and the P. & E. shops at Renovo are also being brought into requisition, to relieve the very healthy demand that is pressing the company.

A new company has recently been organized in Reading, Pa., to be called the Pennsylvania Bolt and Nut Company. The capital is to be \$100,000, with the following officers: H. S. Eckhart, president; James Lord, secretary and treasurer; Thomas Darlington, general superintendent. Mr. Lord was ten years and Mr. Darlington fifteen years in the employ of Mr. J. H. Sternbergh, of Reading. The company are building their own machinery, and expect to be in full working order some time within six or seven months. They expect to have the latest improvements for carrying on business successfully, and the new company will doubtless be a valuable acquisition to the many important industries of Reading.

PITTSBURGH AND VICINITY.

The Pittsburgh Locomotive Works are about to erect a shop connecting with their works 125x75 feet in extent and two stories high. They also propose to build a fine three-story brick office, 50 feet square, on Beaver avenue, Allegheny.

The McKeesport Tube Works have been lighted by Edison's incandescent light, the first of the kind in Western Pennsylvania.

The establishment lately owned by Nellis, Shriver & Co., in Allegheny City, has been sold to D. R. McIntire, who will continue the business under the firm name of Nellis, McIntire & Co.

The firm of Rosenz, Maloney & Co. has been dissolved by the withdrawal of Mr. Enrico Rosenz, and the business of manufacturing glass pots will be carried on by the Messrs. Maloney, under the name of T. & T. J. Maloney.

WEST VIRGINIA.
The hob nail feeders are at work again at the Top Mill, Wheeling.

OHIO.

The Lane & Bodley Co., Cincinnati, builders of stationary and portable steam engines, elevators and ore-crushing machinery, find it necessary to extend their present establishment in order to be prepared to meet the increasing demand for their products. Arrangements have accordingly been made for the erection of a four-story building adjoin-

ing their present works. During the past year the company had a satisfactory trade, all departments having been in a state of increased activity. It is expected that with the aid of the proposed improvements and extensions the capacity of the works will be almost doubled.

Brown, Bonnell & Co. have ordered what is known as the McDonald shield, to be placed upon the puddling and heating furnaces in all their mills. Already two carloads have been received, and the work of placing them in position will be commenced at once and pushed forward until all are furnished. By this invention the employees can work with some degree of comfort, and the liberality of the company in supplying this worthy invention is appreciated by the workmen.—Commercial Gazette.

The Mount Vernon Furnace, after being thoroughly repaired, has blown in again and will run on warm blast. They have plenty of orders.

East Liverpool citizens have contributed money to buy three acres of ground for extensive glass works to be erected by H. C. Fry, manager of the Rochester Tumbler Works.

The Enterprise Machine Company, Geneva, have started their foundry furnaces. When the full force is at work it will number 250 men. The company have over \$40,000 worth of orders for casting on their books.—Cleveland Herald.

The Center Furnace is adding a Player hot blast, and will probably refine. They will run this year on warm-blast metal, and expect to be ready to blow in as soon as stock comes in.

Youngstown is negotiating for the establishment of mammoth locomotive works at that place.

Parties from Bellaire have examined the old Marietta rail mill with a view to purchasing.

The Columbus Rolling Mill will turn out its first steel rails in March next.

The Grace Furnace, owned by the Brier Hill Iron and Coal Company, now holds the belt for the largest daily production of pig iron from a blast furnace in the Mahoning Valley. Last Thursday the product was 142½ tons of No. 1 iron, and the average daily production for the past week has been 125 tons a day.

The Coving Steel Castings Co. have been organized at Cleveland, with a capital of \$500,000. The incorporators are: Stevenson Burke, George Cowing, Willis B. Hale, E. H. Cowles, Theodore Simmons and W. B. Sands. The principal office will be in the city of Cleveland, and the corporation was formed "for the purpose of manufacturing cast steel in all its forms, and for the purpose of purchasing, owning and controlling and selling and leasing to others sundry patents for silica, steel molds, and other patent rights connected with and pertaining to the manufacture of cast steel, and for transacting such other business as may be connected with the principal business for which said company is organized."

The Red Jacket Pump Works, at Cincinnati, are being run to their utmost capacity. The "Red Jacket" received the premium at the Atlanta Exposition as the best pump exhibited. Arrangements are in progress for the formation of a company, and large additional buildings are to be erected, the object being to more than double the capacity of the present works. The members of the new company, whose names have not yet been announced, have arranged to place at the disposal of the manager of the works all the capital necessary.

INDIANA.

Articles of copartnership have recently been entered into by C. P. Slocomb, of Cincinnati (well known in the hardware business), and two other gentlemen, for the purpose of conducting a hardware jobbing business at Evansville, Ind. The firm name is Rock, Thomas & Slocomb.

ILLINOIS.

The Columbia Foundry and Machine Works, manufacturers of heavy lathes, planers and machinery in general, are at present employing nearly 200 men in their various departments. They are making a number of additions to the machinery department in the shape of some new tools for heavy work.

Furness Brothers, of Chicago, manufacturers of the Gould nail machine, are building forty machines for the Riverside Iron Works, of Wheeling, W. Va.

The Gardner Governor Works, Quincy, are unusually busy for this season, being no less than 250 governors behind orders, which accumulate rapidly. Among them is one 12-inch for a Pittsburgh rolling mill; two 10-inch, a 9-inch, with angle valve, for the St. Croix (Minn.) Lumber Company, and another of the same size, with the same style valve, for the Quincy Lumber Company, besides a number of orders for 6, 7 and 8-inch machines. These large sizes are very unusual, and require great skill to insure successful operation.—Industrial World.

The McCormick Harvesting Machine Works, of Chicago, are running day and night. They employ 1300 men.

Charles F. Elmes, of Chicago, is building a very large ice machine on a new system, which employs air instead of chemicals to reduce temperature. The machine is intended for the Fairbank Burnham Machine Company.

WISCONSIN.

A fire at Bay View, near Milwaukee, on the morning of the 12th, damaged the puddling department of the North Chicago Rolling Mill to the extent of \$5000, and the machinery to the extent of \$2000. This, however, we presume will not interfere with the filling of the mill's orders.

MISSOURI.

William J. Park, John Kimpel and C. E. M. Champ are the incorporators of the St. Louis Spring Company, recently organized with \$20,000 capital, for the manufacture of steel springs.

ALABAMA.

We are reliably informed that the rumored consolidation of the iron industries does not concern the Alice Furnace Company. This company have entered into no negotiation and do not expect to.

The Iron Age

AND

Metallurgical Review.

New York, Thursday, February 16, 1882.

DAVID WILLIAMS . . . Publisher and Proprietor.
JAMES C. BAYLES . . . Editor.
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On another page we print a second letter on the subject of the duty on iron ore. A controversial communication disputing statements contained in an article not published in our columns, has less interest than would attach to a presentation of the facts on their merits. We are very willing that iron mine owners should present in our columns the reasons for their demand for a higher rate of duty, but as Mr. Howitt and Dr. Raymond have not favored *The Iron Age* with letters on this subject, we naturally feel very little interest in a controversy to which their views, elsewhere published, may have given rise.

Can Steel Blooms be Imported at the Present Time?

In a remarkable letter to the Secretary of the Treasury, which has just been given to the public, and which we shall treat of more fully at another time, the prospective importation of "steel blooms" in 1882 is represented as likely to be quite extensive. The writer of the letter referred to estimates the duties that will be collected from "steel wire rods" and "steel blooms" in 1882 at about \$3,500,000. Let us see if this is probable. The importation of steel blooms in 1882 will turn on two points, or rather on one proposition and a corollary—that is, on the ability of the mills of this country to supply the demand for blooms and the rails manufactured out of them (for nearly all the blooms that have been imported are for rails), and on the price at which these blooms and rails can be furnished by our mills, compared with the prices at which rails made from imported blooms can be sold.

As to the first point, can our mills supply the demand for blooms and rails? speaking only of Bessemer, a sufficient answer to this question will be found in the statistics of "Bessemer Steel Production," on page 19 of our issue of last week. Already the improvements that have been completed at our Bessemer works will give a production above the production of 1881 of very many thousands of tons in excess of the number of tons of blooms imported. In other words, our mills can supply as many rails as they did in 1881, as many blooms as were imported for manufacture into rails in 1881, and have a large surplus over. This only refers to improvements already completed. When the six converters that are building are finished this will be largely increased. The product of 1883, if not of the last six months of 1882, will be at the rate of 2,000,000 tons of ingots a year.

Now, what effect will this have on prices? It goes without saying that it will tend to reduce prices both for rails and ingots. It has already had this effect, and to-day steel blooms can only be imported and rolled into rails at a profit in exceptional cases. Our last cable dispatch quoted blooms at 112/6, or £5. 12/6. Freight, Liverpool to New York, 17/6. This would make the cost of steel rails as follows:

Cost of blooms in England	\$7.12
Duty at 45%	12.30
Freight to New York	4.92
Commission, brokerage, credit, &c.	1.95
Freight to Mill	2.20
Cost to roll into rails	4.00
Total	\$4.79

And this without including anything for freight from English mill to seaboard, or any allowance for waste, crop ends, &c., and putting many of the items below what they really are. Our Philadelphia correspondent quoted blooms at \$46 duty paid, or £6. 12/6 c. i. f. Philadelphia. Add the two last items above to this, and the rail would cost \$56, without any allowance for crops. Rails can be bought for this price, or less, and the fact that sales of blooms have been made from second hands at lower prices than those quoted, shows that holders believe that now is a good time to unload. Blooms cannot be imported to-day and rolled into rails at a profit. How much lower blooms can be sold on the other side is a question we are not prepared to answer, but the outlook is that the \$3,000,000 duty which the writer of the letter to Secretary Folger indicates will be derived this year from "steel blooms," &c., will not be collected.

The Tariff Commission Bill.

The Tariff Commission Bill is now fairly launched in both houses of Congress. The Morrill bill has been before the Senate for some time, and several speeches have been made with it for a text, but consideration has been postponed by the debate on the Funding Bill, which is now out of the way, and by the Arrears of Pensions Bill, which will soon be disposed of. Mr. Morrill has given notice that he will antagonize all bills with the Commission bill, which means that he, as Chairman of the Finance Committee, will insist upon some disposition being made of this bill—after debate, of course.

In the House, the Ways and Means Committee have introduced Mr. Kason's bill, amended so as to confine the action of the commission to tariff subjects alone, the provision authorizing them to investigate the internal revenue question being stricken out. This provision was stricken out in concession to a feeling that exists favorable to the "immediate reduction and gradual extinction" of the revenue on spirits, tobacco, &c. This bill, as reported in our Washington letter last week, provides for a commission to be called the Tariff Commission, to consist of nine members from civil life, to be appointed by the President, by and with the advice and consent of the Senate. But Mr. Randall has given notice that he will move to amend by having the commission composed of two Senators, three members of the House and four civilians. It is uncertain what will be the fate of the Commission bill. Old members of both houses, who remember the results of the labors of previous commissions, do not take kindly to the idea of a commission, and it is reported that several Senators, among them Sherman, Plumb and Jones of Colorado, are opposed to it. It is evident that the vote will cross party lines. There has also been a decided change of opinion among members of the House who have been favorable to the commission heretofore. It is believed that the present Congress should take some definite and final action on tariff

matters. The commission is only tentative. Its action may or may not be acceptable. When it reports, this Congress will have but three months of life, a time inadequate to correctly examine and discuss the report, especially in view of the attacks that will be made on any report the commission may present. These members believe that the present Congress was elected to act finally on the tariff and that it should so act. The condition of affairs also leads some of the shrewdest to believe that Congress had better keep in its own hands these revenue questions, so that they may be prepared at any time to take any action needed. On the whole, the situation is "mixed," and it is impossible to tell the outcome. The course of the debate in the Senate over the bill during the next few days will decide its fate.

The National Association of Stove Manufacturers.

The meeting of the stove manufacturers, held last week in Cincinnati, was perhaps less fruitful of practical results than any previous meeting. The social features were delightful. Members attending from other States greatly enjoyed their visit; but from lack of any previous preparation of an order of business much valuable time was lost, and when discussion of the questions of trade interest fairly began there was apparently no unanimity of sentiment, and no opportunity to reach a conclusion on any of the many subjects demanding the attention of such a body.

After electing its officers for the ensuing year, the Association directed the appointment of a committee to prepare business for the meeting and then adjourned. This committee was not able to report until the following day, so beyond electing its officers and some new members, nothing whatever was done on the first day of the session. When the committee's report was received, it was found to be in some respects so radical in its recommendations that it could only be adopted in part, and many subjects of great importance which might have been included in it seem to have been forgotten by the committee during the four or five hours of its deliberation.

The first and most important of the committee's recommendations related to prices. On this subject the report recommended that, in view of the increase of from 15 to 20 per cent. in the cost of materials entering into stoves, and an increase of fully 10 per cent. in the average cost of labor, the selling price of stoves be advanced 10 per cent. over the basis adopted at the June meeting last year. This recommendation met with sharp opposition. It was finally rejected by a heavy vote, and a substitute adopted, declaring "that it is the opinion of this body that the 'advance in raw material and labor war' runs and suggests a general advance of 'prices.' The reason for this non-committal action is probably found in the unsettled condition of the labor market, which, though a matter of the greatest practical importance, the association did not deem it expedient to discuss. For repairs and odd plates, the rate approved by the society is 8 cents per pound, and the discount agreed to on hollow-ware is 50 per cent. off the established list. The committee recommended that the credits in the stove trade be shortened, and the usual term of four months be reduced to thirty or sixty days. This was debated somewhat vigorously, and a good deal was said in favor of a shortening of credits, but the trade was obviously unprepared for such a change, and the recommendation was rejected. A resolution, directing the secretary to issue a circular requesting the railroad companies to give better and safer transportation for stoves, and to reduce the cost of repairs for new goods, was adopted without discussion. There is no question that the evil complained of is a serious one, but it can scarcely be remedied by resolutions or circulars. The committee also made an unwise recommendation, that the offices of secretary and treasurer be combined in one, as the society needs more than anything else a permanent paid secretary, who will give his attention to working up statistics of the trade, and to the elaboration and editing of its publications. The movement suggested by the committee is entirely in the wrong direction.

The foregoing represents about all the action of the association relating to business. We do not wonder that many of the members, especially new members in attendance for the first time, were disappointed at the discussion and dissatisfied with the action which followed. As one of the members forcibly remarked, the meeting was very pleasant and the social features were all that could be desired, but the session lacked the true ring of business. His suggestion that the committee appointed to prepare a list of topics for discussion should have at least six months for deliberation, was a good one. It was, as many manufacturers well remember, made a duty of the Executive Committee to prepare such an order of business in advance of each meeting, but we believe that they have thus far neglected this duty. It is to be hoped the special committee appointed will give it the attention it merits.

There seems to be a growing conviction among manufacturers represented in this association that, to ignore the labor question entirely and exclude discussion relating to it from the meetings, is a mistake. We think so, too. While it is possible that the molders would make such use as they could of what was said on this subject at the meetings, the

obvious fear of the Molders' Union shown by the manufacturers when they come together gives the molders vastly more encouragement than they would derive from anything that might be said. There is really no reason why the molders should be regarded with such tender consideration as has hitherto been shown for their feelings. They have been accorded an exaggerated importance in the trade. They are paid out of all proportion to other labor requiring equal skill, and their present attitude is one of organized hostility to the interests of manufacturers. If the latter imagine that by ignoring the labor question in their meetings they deceive the molders, they are mistaken. If they imagine that by refusing to agree to an advance in prices they convey to the molders the impression that they intend to charge no more for their stoves this year than they did last, they are mistaken again. In fact, there is every reason why this great question should be discussed fully, fairly and exhaustively, and no reason why it should be shirked, or why reference to the demand of molders for increased wages should be silenced as if it was a treasonable utterance.

It is not necessary, perhaps, that the National Association should take any action on the subjects of labor and wages, but it would be of immense advantage to discuss these matters, and without such discussion any action it may take with regard to prices fails to impress the trade as taken in good faith and with a purpose to conform to it in disposing of their products. Of course, an association so constituted cannot fix prices. It has no means of enforcing its decisions, and were it to attempt this, it would fall to pieces like a house of cards. For the same reason it cannot fix wages, but until manufacturers can muster up courage and look the Molders' Union squarely in the face, and tell each other the plain truth about its demands and how they are to be met, the Association's usefulness will be restricted within very narrow limits.

Steel Ships for the Navy.

The testimony given before the Committee on Naval Affairs of the House of Representatives as to American steel for shipbuilding, fully justifies the editorial in our issue of January 5 on the relative quality of English and American steel. It will be remembered that the editorial in question was called out by a remark in the *New York Times*, which seems to omit no occasion, good or bad, to decry American products and American ideas. The *Times* said: "It would be particularly 'unwise to build American men-of-war of 'American steel, for, however good our iron may be, we have not yet been able to produce steel that is at all equal to English 'steel, and Mr. Vanderbilt prefers to import 'steel rails for his road at a very much 'higher price than he would have to pay for 'home-made protected steel."

The testimony before the Naval Committee is to the effect that it would be particularly wise to build American men-of-war of American steel. It was shown to the committee that steel plates for boilers (and the conditions of plates for boilers and ships are the same) were first successfully made by Hussey, Wells & Co., of Pittsburgh. It was shown that for years the attempts of the English to make these plates were absolute failures, and that the years of discredit that injured the reputation and delayed the introduction of steel plates for shipbuilding were due to the extremely poor character of English steel plates, and that their reputation was established and maintained by Pittsburgh steel manufacturers. The difficulty with English plates was their high carbon and great tensile strength, which were hostile to ductility. Examples were given of the rupture of boilers made out of English steel at forty pounds steam pressure, and of these boilers with plates of high tensile strength and low ductility breaking of their own weight. The American practice, on the other hand, sought a comparatively low tensile strength, carbon below 2-10 of 1 per cent., and an increased ductility, and the result was a successful steel plate. The experience of the Pennsylvania Railroad with steel plates of English make was a bitter one, and it was only with American plates that they had any success for years. Latterly, however, the English have begun to learn from us the secret of making steel plates for boilers and ships, but American steel plates for these uses are better to-day than English and always have been better. The Livadia's experience would not have occurred had the plates been American, for we have had a longer and more successful experience in manufacturing them than the English.

It seems quite well settled that the Committee on Naval Affairs will recommend the use of steel in the hulls of vessels to be constructed for the navy. Mr. Roach recommended steel, although his interest would have led him to recommend iron. Mr. Gibbons, President of the Fuses & Jones Ship Building Co., Wilmington, Del., also advised the use of steel in preference to iron. The only fear has been that in case steel was adopted it would not be possible to get American steel, but this fear is groundless. A dozen works that could be named have all the facilities for turning out the steel and making the plates, and a number of iron mills have plate mills that have been built with a view to rolling steel some time, so that this fear may be dismissed.

The meager attendance at the so-called anti-tariff caucus of the House of Represent-

tatives, less than forty members being present, shows that the free traders still remember their defeat in a previous caucus when they attempted to force their party into the attitude of opposition to protection.

The Collapse of Speculation.

Indications are multiplying that the gigantic speculations in some of the leading staples, maintained for six months past at a fearful cost to the general interests of the country, are approaching a collapse. Some of the principal actors have already succumbed under the load imposed by declining prices, and the eagerness of others to "stand from under" is plainly apparent. The decline in prices, however, is met by corresponding weakness in the foreign market, so that the much-desired export basis recedes, as a natural consequence of the pressure to unload. But the end cannot be far away, and if individual fortunes vanish in a sweeping disaster, the country at large will exult, rather than repine. The public verdict will be, that those who conspire to maintain exorbitant prices, to the detriment of all legitimate business interests, experience no more than a just retribution if they are hoist by their own petard. Their fate would be like that of the man in the fable who, hoping to profit by the coming famine, hoarded his grain only to find a heap of putrefaction when the doors were opened.

The gradual shrinkage of values which is beginning to attract attention in business circles, is thus noticed by a writer who frequents the Produce Exchange: "In Chicago, 'March wheat sold a week ago at \$1.31 3/4, and May corn (the favorite option) at 66 3/4 cents. Since then the former has touched '\$1.25 3/4, and the latter 61 3/4 cents. March 'pork declined recently from \$18.50 to about '\$18, and March lard from \$11.40 to about '\$11.' In a speculative business, where fortunes are gained or lost on changes amounting to a fraction of a cent, the significance of figures like these can be easily understood. Already there are intelligent observers who anticipate a speedy renewal of shipments by sea and by rail, starting anew the wheels of commerce, checking the export of gold, and returning to channels of legitimate pursuits enormous amounts of capital now otherwise employed. Taking lessons from the past, however, it is safe to assume that foreign buyers will not take hold greedily on the first symptom of decline. The losses sustained in a protracted derangement of the American export trade are too heavy to be reimbursed very soon on a small margin of profit. But when the obstruction is once fairly removed, and grain and cotton go out in conformity to the laws of supply and demand, we shall have no lack of commercial bills in regulating foreign exchange. The end wished for is hastened by the remarkably mild winter in the Northwest, giving promise of early and abundant crops.

We publish elsewhere the remarks of Mr. E. Windsor Richards on the English and American steel trades, made at the recent annual dinner of the Cleveland Institution of Engineers. Mr. Richards justly appreciates the good work done by several of our large establishments, such as the Edgar Thomson Steel Works and the Bethlehem Works, and states that, since the output of the former establishment for some time past was probably the largest quantity obtained from an American plant of two eight-ton converters, and as this year the three ten-ton converters will be in full operation, it will be interesting to note this output for future comparison. Mr. Richards attributes the larger output of American as compared with English works, to the fact that with such hurried work English producers could not fulfill the conditions of the exacting specifications of English and Continental engineers. After briefly reviewing the improvements and extensions contemplated in most of our steel works, Mr. Richards gives a short account of American rail rolling and blast-furnace practice, considering the latter inferior to that of the Cleveland district. Concerning engineering matters connected with iron manufacture, a novel plan of erecting the casings of fire-brick and wrought-iron chimneys is described, this method being adopted by the Pennsylvania Steel Works, Harrisburgh. Mr. Richards also gives some account of the general prosperity of our country, which he attributes to the influence of protection, and in concluding states that though English ironmasters are all sound free traders, there is probably not one who would not instantly become staunch protectionists if his works could be transported to American soil. From all that Mr. Richards has been able to gather during his American visit, he predicts a good year's trade for us, and thinks that, notwithstanding our great efforts to supply our own wants, we must have Cleveland pig iron and hematite Bessemer iron. A careful perusal of Mr. Richards's remarks will be amply repaid by the large amount of interesting information contained therein.

Over the signature of "Steel Rail Manufacturer," which will scarcely serve to cover the writer's identity, the absurd statement of the *Times* that the Bessemer interest of this country is a monopoly, is effectively and neatly disposed of. He writes: "Your Philadelphia correspondent 'misleads you. The Bessemer patents have expired; the field is clear to all; the three 'new works now building have no royalty to pay. All that the association has now

"are some mechanical devices, the use of which is offered to any one for fifty cents per ton. The new works prefer not to use these." We shall not attempt to discuss the question of protection with the *Times*, but surely we shall be found hereafter agreeing upon one point, viz: To charge that the manufacture of Bessemer steel in this country is a monopoly protected by patents "would be such a mistake as the *Times* would not like to make again in its editorial columns." Of the truth of every word of this there is not the least doubt, and yet we presume the old falsehood will continue on its travels, and that many a rhetorical free trader, both in Congress and out, will use it to point a moral for years to come. The old argument about taxing the poor man's shirt, which Henry Clay showed the absurdity of years ago, and which every one supposed dead and buried and turned to dust, "bobbed up serenely" before the Ways and Means Committee last week, in the mouth of a manufacturer of barbed wire. Such an argument from such a source is indeed a surprise. We should as soon have expected to hear an argument of the driven-well people against the liberality of our present patent law.

Hon. Thomas M. Bayne, of Allegheny, introduced into the House of Representatives last week a resolution calling for information regarding the arrest in Mexico of some glass blowers, who went from Pittsburgh to operate a glass factory near the City of Mexico. It seems that these men were induced to go to Mexico on a promise of \$130 a month when the furnace was in operation, and \$1.00 a day when idle. The men write from Apam Jail, Mexico, as follows:

DEAR SIR.—We are three American citizens hired last July in Pittsburgh to come to Mexico to a place called Appapawaco for \$150 per month in American coin and our passage and expenses paid and one dollar per day when not in blast. N. B. the words "not in blast" mean if they want us to stay the next fire they pay the blowers the dollar to stay while the fire is out. Instead of taking us to the above place they brought us to Anam, another place entirely. There was no furnace, no pots, nor hardly anything on the premises. And for five months we did not blow. No fault of ours. We asked for a settlement, and they refused us one. We told them we would not work. We left and went to Vera Cruz, intending to go home. They sent a telegram and had us arrested and put in jail; they kidnapped us up here under false pretense; they have trumped up a charge against us for violation of contract when they broke the contract first; they have charged us with our passage and expenses here, and only want to allow us one dollar per day from the 14th of July until the 6th of December, the day we commenced to blow. We have no money and cannot speak the language, consequently have no counsel.

There seems to have been at least a misunderstanding, and we call attention to the too great eagerness of workmen to go to a great distance without carefully understanding the terms. They get an idea of what the terms are, oftentimes an erroneous one, or it may be that, as seems the fact in this case, they get the right idea of the terms, but they turn out to be different from what they supposed, and trouble results. These large offers from other countries are too often false lights. In most cases it is best for the workmen in this country to stay at home.

The foreign commerce of New York for January shows an extraordinary aggregate, the imports reaching a value equal to \$40,135,673, which amount has never been surpassed in any corresponding month, except in January, 1880. While the imports increased \$8,399,157 above the January imports last year, the exports of merchandise and produce decreased \$2,416,185 for the same time; but taking the trade of all the ports together for the last seven months, there is still a balance in our favor. The cash duties collected in the six months ending December 31, amounted to \$38,470,994, which is much larger than for any previous six months in our history.

The Assay Commission appointed to count, weigh and assay the coinage of the United States Mint during the year 1881, have completed their work, and are said to be particularly gratified with the results. The count verified the respective amounts exhibited by the official books, the total exceeding \$100,000,000 in gold and silver, and it appeared that the greatest deviation in fineness from the standard in the coinage under examination was far within the limits allowed by law. Such facts are creditable to the Government and to the fidelity of those chosen to responsible trusts.

Mr. W. H. Melhuish, of Williamsport, Pa., some time ago invented a breech-loading cannon, which, we are informed, is an extremely effective weapon. A gun constructed according to his views, 3½ feet long with 1½-inch bore, weighing 160 pounds, was recently tested with entirely satisfactory results. As soon as the gun is discharged the breech is thrown open, ejecting the shell of the cartridge by means of a spring, and allowing a current of fresh air to rush through and cool it off. The unlocking of the gun and the throwing open of the top side of the breech require scarcely a second of time, and in another second the gun can be charged, the breech relocked and the firing done. It requires neither rammer nor swabber, and in case it should have to be abandoned on the field of battle the withdrawing of a pin through the hinges of the breech door will render it impossible for the enemy to turn it on the retreating forces. It is said that the force of the weapon can now equal to that of any long-distance gun now in use, and that the size may be readily adapted to the needs of the service, either for use in fortifications, on war vessels or in the field. The gun is manufactured at the Valley Iron Works, Williamsport, Pa., and its capacity is thirty shots per minute.

The Duty on Iron Ore.

To the Editor of *The Iron Age*: The attempt of the ore miners of Morris County to protect themselves against a too great importation of foreign iron ores seems to excite a great deal of indignation on the part of the conductors of the *Engineering and Mining Journal*, who probably think that common people have no right to opinions. They claim that the memorial offered to Congress is reckless in its statements. The quantity named, 724,210 tons, is probably correct, as the Treasury reports show the import from June 30, 1881, to October 31, 1881, to be 351,704 tons for a space of four months. The value of \$2.84, which is undoubtedly the invoice value, is only represented as laid down on our docks when brought as ballast, paying no freight and exclusive of the duty. The duty is that amount in round cents that would be levied upon an invoice at that price, the precise amount being 56.8 cents; this duty, of course, is to be added to the invoice in making up the cost to the consumer. Admitting the claim that wages average between thirty-five and fifty cents per day, what kind of pay is that for a laboring man to support a family on? "Put yourself in his place." Imagine the editor of the *Engineering and Mining Journal* working for thirty-five cents per day; it wouldn't pay for his breakfast. It is further stated that "Jersey Ore's" statement that the Bilbao ores have been laid down at less than \$2 per ton on board ship during the past year, is misleading. The price of ore, as stated, is not disputed, and so far from being misleading the statement leads directly to the point on which all native ore men should keep their eyes fixed, for if it were not for the development of the Bilbao mines there would be scarcely any cause of alarm among our ore producers about foreign ore. The quantity of ore at Bilbao is enormous, the Somorrostro mines being estimated in 1879, by competent engineers, to contain 60,000,000 tons of ore, this being only one of numerous other mines; the estimated cost of excavation was less than twenty cents per ton, and the mines lying near the seaboard, the ore could be delivered on board ship for about seventy-five cents per ton, including royalty. There is nothing in the world equal to these mines in quantity of ore and cheapness of production.

Mr. Hewitt's letter was a bold attempt to hoodwink the Morris County miners. There are but few of the ores of Morris County that can be mixed with foreign ores, four-fifths of them being too high in phosphorus to ever be used in making Bessemer steel by the direct process. The statement "that every ton of foreign ore that is brought here enables a ton of our ore to be used which would otherwise find no market," is controverted by the statement in editorial of 25th inst., that Mr. Hewitt's firm "manufactures no Bessemer iron, has never extensively imported foreign ore, is now using exclusively native ores, is mining now more than their own large consumption and selling the surplus." His statement that his firm is the largest miner refers strictly to the present, being made particularly for the purpose of giving weight to his previous statements, though the fact remains that neither in the aggregate nor at the present is his firm the largest miner. His movements are controlled strictly by his disposition as a manufacturer to keep down the price of labor to the lowest possible point; his letter is what is generally known as a piece of "taffy," and Morris County wants no more of it. For the information of the public it is well to state how Mr. Hewitt is protected as a manufacturer. The duty on some of his products at Trenton are as follows: Bar iron, \$33.60 per ton; iron wire, \$50 to \$100 per ton, according to size; beams and channels, \$28 per ton; chains and cables, \$56 per ton. As by the census reports of 1880 it requires 2¼ tons of iron ore to make 1 ton of iron, it would seem that it would take more than \$3.50 worth of ore to make a ton of iron. Chester ores are the lowest priced in Morris County, the best ores selling as high as \$5.50 per ton. The estimate that two-fifths of the cost of the iron is in labor in ore was based upon an average price of \$4.50 per ton at Port Oram for a 50 per cent. ore adapted to the manufacture of foundry iron, making \$9 for enough ore to make a ton of iron; allowing 50 cents per ton of ore royalty and 40 cents per ton for mine profit and charges other than labor, brings the cost of the labor in the ore required to make a ton of iron to just the price named—\$7.20—as being two-fifths of the total cost of the iron. As the *Engineering and Mining Journal* seems to be sadly rusty on Morris County ore matters, they had better send up an expert to report. "Foreign Ore," in a letter to the *Engineering and Mining Journal* of February 4, thinks that the duty on iron ore would injure the pig iron men. If that is the case let the pig iron men apply for higher duty. He seems to be a little off in his geography, evidently supposing Cleveland to be a seaport on Lake Champlain. As figures never lie, it is well to compare the protection to labor afforded by the duties on steel rails, pig iron and iron ore. The probable cost of labor in converting a ton of pig into steel rails is about \$7, which, with the duty of \$28 per ton, makes a protection of 400 per cent. The cost of the labor in reducing ore to pig iron is \$2.50 per ton; the duty is \$7, or 280 per cent. The cost of the labor to produce sufficient ore to make a ton of iron is \$3.20; the duty is \$11.14, about 16 per cent. The duty on iron ore, in order to afford the same protection to labor as that on steel rails, ought to be about \$14 per ton. Iron ore is inadequately protected as compared with other products of the earth obtained by digging, quarrying, excavating or mining, such as unwrought clay, pipe-clay, fire-clay—duty, \$5 per ton; bituminous coal, 75 cents per ton; grindstones, rough or unfinished, \$1.50 per ton; finished, \$2 per ton; marble, \$5 to \$10 per ton; stones, freestones, granite, sandstone and all building or monumental stone except marble, \$1.50 per ton. An adequate duty on iron ore should not be less than \$1.50 per ton, and \$2 would seem to be about right. There is no doubt that it is desirable to import some of the better grades of foreign ore, but the importers can afford to pay a reasonable duty toward the support of the Government. On the lower grades of ore these duties are necessary in order to

give the miner of New Jersey \$1.50 per day, as against 35 to 50 cents per day paid in Spain. All duties, to be effective, should be specific, whether levied for revenue or protection.

JEREMY ORE.

The Basic Process.

The following letter, just received from Mr. Sidney Gilchrist Thomas, will be read with interest:

27 TEDWORTH SQUARE, CHELSEA, LONDON, S. W., JANUARY 24, 1882.

To the Editor of *The Iron Age*.—Sir: I observe in the issue of December 29 of your usually peculiarly well-informed paper, an article on Mr. Reese and the basic process, which is evidently founded on erroneous information, and is, I venture to think, calculated to considerably mislead your readers. A preliminary decision has indeed been given in two cases in which Mr. Reese and myself are concerned, which relate to a proposed modification of the basic process. The decision has been appealed, and the question is therefore still *sub judice*, and any comment on the matter on my part would, in consequence, be disrespectful to the court. When a final decision has been arrived at, I hope to ask the hospitality of your columns for a statement of the true position of the case, which, I venture to believe, will give it a very different complexion. Any one who will take the trouble to read the various patents issued to Mr. Reese between 1865 and 1877, can readily form his own estimate of the merits of Mr. Reese's recent claims. In the meantime, I may state that no one of the series of patents which cover the actual basic process, as now regularly used under my license in England, France, Germany, Austria, Belgium and Russia, in the production of over 30,000 tons of steel monthly, is even in interference, all having been granted by the United States Patent Office, and remaining, so far as I am aware, uncontested.

Yours truly,

SID. G. THOMAS.

The McKinley Bill.

The Western Iron Association at its recent meeting, adopted the following memorial to Congress:

To the Senate and House of Representatives in Congress assembled: This memorial of the Western Iron Association respectfully sheweth:

That the Western Iron Association is an organization composed of the manufacturers of merchant iron west of the Allegheny mountains, including upward of seventy rolling mills, located in the States of Pennsylvania, West Virginia, Ohio, Indiana, Illinois, Michigan, Wisconsin, Kentucky, Tennessee and Missouri.

These mills represent many millions of capital invested and employed. They give employment directly to over 100,000 workmen, and indirectly by reason of their great consumption of ore, coal, limestone and pig iron, and of agricultural products by those employed, to many thousands more. For the protection of this labor and this capital, in connection with that employed in other industries, the tariff laws now on our statute books have been enacted. Through a failure in the wording of these laws to clearly define their true intent and meaning there has grown up under the action of the so-called "omnibus" clause a body of decisions that are hostile to the spirit of these acts, and have reduced the duties to be levied on certain articles very much below what Congress, in these acts, evidently intended they should be. These decisions have substituted ad valorem rates for specific rates, contrary to the spirit of these acts, thereby inviting undervaluations and frauds on the revenue. They have also resulted in many cases in reducing the duties on articles from which they are made, a clear violation of the spirit of the tariff acts. To correct these decisions and provide for the enforcement of these acts in their true spirit and intent we respectfully urge the immediate consideration and prompt passage of the following act, which has been reported favorably to the House of Representatives by the Committee of Ways and Means:

"Be it enacted, that title 33 Revised Statutes be amended by adding to schedule E of said title the following: 'Provided, that on all iron or steel, and on all manufactures, wares, vessels and articles of iron or steel, or of which such metals or either of them shall be the component part or material of chief value, whether wholly or partially manufactured, there shall be levied, collected and paid no less rate of duty than the duty or rate of duty imposed upon said goods, or upon any part or material of said goods in any of the forms in which it or they last existed prior to their passing into the form or article upon which duty is to be levied. This act shall not apply to nor in any manner affect articles specifically enumerated in this title by their commercial designation, but shall only apply to articles designated in this title as manufactures of steel, or of which steel shall be the component part, not otherwise provided for; steel in any form not otherwise provided for; manufactures, articles, vessels and wares not otherwise provided for, of iron, or of which iron shall be the component material of chief value; metals unmanufactured not otherwise provided for and castings of iron not otherwise provided for.'

Annual Patent Office Report.—The annual report of the Commissioners of Patents for the year ended December 31, 1881, has been presented to Congress. The report shows that the total receipts of the office during the year from all sources were \$853,665.80, and the expenditures \$605,173.28. The total balance in the Treasury of the United States on account of the patent fund on January 1, 1882, amounted to \$1,880,119.32. Acting Commissioner Stockbridge in his report says: "The receipts of the office during the past year exceed those of any previous year by nearly \$100,000, and the excess of receipts over expenditures, \$248,472.61, has been correspondingly greater. In no former year have there been so many applications for patents, though the number of patents granted in 1876 exceeded that of the past year. The Commissioner recommends a provision of law for taking testi-

mony in cases where the question of public use is raised, similar to that already existing, for taking testimony in interference cases. The Commissioner urges upon Congress the pressing necessity of increasing the examining force of the office, and providing more room for the use of the office. The following is a summary of the business of the office during the past year: Number of applications for patents for inventions, designs and reissues, 26,059; number of caveats filed, applications for registration of trade-marks, labels, &c., 4183; total number of applications requiring investigation and action, 30,242. During the year there were issued 17,620 patents and designs, as against 16,584 for the year ending December 31, 1880.

American Institute of Mining Engineers.

The annual meeting of the American Institute of Mining Engineers, to be held at Washington, will open on Tuesday, the 21st, with addresses by the Hon. N. P. Hill, on behalf of the Regents of the Smithsonian Institution, and by Major J. W. Powell, Director of the United States Geological Survey, and Chairman of the Local Committee of Arrangements. At the conclusion of this session Major and Mrs. Powell will hold a reception for the members of the institute and the ladies accompanying them. The morning session on Wednesday, February 22, will be devoted to the reading and discussion of papers, and at a special session to be held in the afternoon in memory of the late Alexander Lyman Holley, it is expected that a number of those members who personally knew Mr. Holley will speak, each contributing briefly from his own experience. Such as cannot be present are invited to send letters to the secretary before the meeting, and it is believed that a general response to this invitation will yield a more appropriate tribute to the many virtues and varied accomplishments of the deceased than any single and elaborate eulogy. The evening session, at 7:30, will be devoted to papers and discussions on iron and steel as structural materials. Papers will also be read and discussed at 10 a. m., February 23, and in the afternoon an opportunity will be afforded to visit the White House and the Treasury building. There will be a subscription dinner in the evening, and we can but express the hope that it will be characterized by the entertaining and pleasant features experienced on previous occasions. A session will be held at 10 a. m., Friday, February 24, for the reading and discussion of papers and for the transaction of necessary business, while in the afternoon a visit will be made to the Bureau of Printing and Engraving. All the sessions of the institute will be held in the National Museum building, and it is to be hoped that a large number of members and associates will be present. The Pennsylvania Railroad will sell excursion tickets to Washington from Pittsburgh and points on the main line, and from Boston, New York, Trenton and Philadelphia. These tickets can be bought only on the presentation of card orders, which are distributed, on application of members, by the secretary of the institute.

The Proposed New York Iron Exchange.

At 3 o'clock on Wednesday afternoon a large number of gentlemen connected with the iron and metal trades assembled in one of the upper rooms in Delmonico's Hotel, No. 2 South William street, to consider the question of organizing an Iron Exchange in New York. The call for this meeting was published in full in our last issue. When about a hundred gentlemen had gathered in the room, Mr. Judson called the meeting to order, and moved to organize by the election of Mr. E. S. Wheeler as chairman. The motion was carried with enthusiasm, and Mr. Wheeler took the chair. Mr. U. O. Crane was then chosen secretary, and the meeting proceeded to business. The chairman read the call and stated that it had been thought that an Iron Exchange, if it were possible to organize one in New York, would conduce to greater harmony in the trade, prove serviceable to all engaged in selling and buying iron, save much valuable time in effecting transactions, and promote other good objects. He called for a general expression of opinion, but most of the gentlemen present were apparently reluctant to open the discussion.

To bring the matter properly before the meeting, Mr. Judson moved that a committee of seven gentlemen in the iron and metal trades be appointed by the chair to mature a plan of organization and present it at a meeting to be held two weeks hence. Seconded.

Mr. Delafield advised that before the motion was put to a vote, there be a general expression of opinion. He understood the object of the meeting to be a general interchange of views, and without such interchange the committee, if appointed, would find difficulty in maturing a plan likely to be acceptable.

Mr. Flynn moved as an amendment, that the committee consist of fifteen instead of seven, as the meeting was a large one, and a better expression of the views of the trade could be had by thus increasing the size of the committee. Personally, he favored the idea of organizing an Iron Exchange. No other trade of equal importance was without one. He thought it had become a necessity, and believed that the meeting would initiate a movement leading to the establishment of an exchange which would rank with the most important commercial exchanges in the United States. Mr. Flynn's motion to increase the committee was seconded.

Mr. Judson opposed making the committee so large, unless the object of the motion was to kill the movement. He said that after a long experience he had reached the conclusion that a large committee was not needed and seldom did any practical work, while if the matter was left to a small committee, it would be much more likely to discharge the duty committed to it in a satisfactory and thorough manner.

Mr. Flynn said that it was scarcely necessary for him to disclaim any desire to kill the movement. He thought that a committee of seven gentlemen could not properly canvass the trade, nor could it properly include all the branches likely to be inter-

ested in the movement. A good deal of talk followed, and a motion was finally carried making the number of the committee nine as a compromise. The question now being the original motion to appoint such a committee, it was carried unanimously without discussion.

The chair then called for suggestions as to the composition of the committee and the instructions to be given it.

Mr. Delafield offered the following: "Resolved, That it is advisable and proper that an Iron Exchange should be formed at this time."

He stated that this motion was introduced to secure an expression of the sense of the meeting. He saw no reason why the exchange could not be formed out of the elements gathered at the meeting which would be strong and permanent. The advantage of an exchange seemed to him to be greater facility of communication between the different branches of the trade, greater rapidity in effecting exchanges, and an enlargement of the scope of the trade. The rules adopted by such an exchange would add greatly to the stability of the iron business. Its arbitration committees would decide many questions which now lead to protracted litigation and much hard feeling. It would establish regulations governing such intricate questions as what constitutes No. 1 and No. 2 scrap. It would regulate, by a uniform system, brokers' contracts, and any contract made on the floor of the exchange would become binding between buyer and seller. For these and many other reasons he personally favored the Iron Exchange.

Mr. Robertson thought it was taking the matter out of the hands of the gentlemen of the committee to anticipate their report by discussing the advantages of such an exchange. Mr. Delafield's motion was seconded, however, and seemed to be favorably regarded.

A gentleman called for the views of the pig iron manufacturers, if any were present. He thought it would be desirable and beneficial to know how they viewed the movement. The chair called on Mr. Brinsmade, of Edward Beck & Co., but that gentleman declined to speak. The question being called for, Mr. Delafield's motion was carried without opposition.

Mr. Thos. J. Pope was then called on for his views. He thought the exchange would be an advantage in many ways, primarily in establishing a standard of morality in business, and the settlement of disputes which can now only be settled before the courts.

Mr. Judson asked the chair to call upon Mr. Leech, Mr. Boynton and Mr. Robinson for their views. Mr. Leech, in response to the invitation of the chair, said he was still undecided as to whether the exchange would or would not be an advantage to the trade. An exchange was, he thought, calculated to foster speculation. On the Produce Exchange, the Cotton Exchange and the Oil Exchange, speculation was a prominent feature of the business transacted. If one of the effects of an Iron Exchange would be to encourage speculation, he was satisfied it would be undesirable. The iron trade differs from many others. It has no safety valve in a foreign demand. Speculation, if started here, would have to be worked out in this country, and he was not a little afraid that an Iron Exchange would lead to a speculation which could only be liquidated by the bankruptcy of the speculators.

Mr. Boynton was called upon and stated that, in his judgment, the object of an exchange was mutual protection and greater facility of communication. He was not certain, however, that the iron trade was sufficiently concentrated to make it desirable to have an exchange in New York. He wanted to hear from representatives of Philadelphia, Pittsburgh and other cities on this subject. If an exchange was possible, he considered it very desirable—if, indeed, the iron trade is not an exception to other trades. He sometimes thought it was an exception.

Mr. Robinson was called on, but had left the room.

Mr. Evans was then asked to speak. He said he had not given the subject sufficient consideration, and had come to be instructed rather than to give his views. He knew nothing about exchanges, but thought an Iron Exchange would be of advantage if there was anything which could be dealt in on the floor. It would certainly call people together and perhaps accommodate some in the trade. For his own part, he did not think he could get any more for steel rails on 'Change than he could get in his office, and he rather expected that he would have the figures quoted on 'Change presented to him to see if he could do as well or better.

The chairman remarked that as Mr. Pope had suggested that one effect of an exchange would be to raise the standard of business morality in the trade, there would probably be less lying after it was organized than now. This remark was received with much laughter.

There being no further business before the meeting, a motion to adjourn, subject to the call of the chairman and the committee, was carried, and the room was quickly cleared.

Mr. Wheeler presided with admirable promptness and dignity, and kept the meeting from falling into a snarl on questions of parliamentary usage, which at one time seemed inevitable. He will appoint the committee after careful deliberation, and include as far as possible all branches of the trades interested. The second meeting, to hear the report of the committee, will probably be held in about a fortnight. Due notice of the time and place will be given in *The Iron Age*.

Farming implements of American manufacture are rapidly finding their way to the agricultural districts of Europe. The British steamer Lord Collingwood is coming around from Baltimore to load here with a full cargo of agricultural implements for Sebastopol and Odessa on the Black Sea, in Russia. American reapers, binders and thrashing machines will be one of the sights to be witnessed in the grain fields on the Black Sea next season.

Gen. M. C. Meigs writes from Washington City to advocate the adoption by municipal fire departments of bows and arrows, with cord and rope, as a life-saving apparatus. Compared with the cost of providing every lofty building with fire-escapes, the expense would be trifling.



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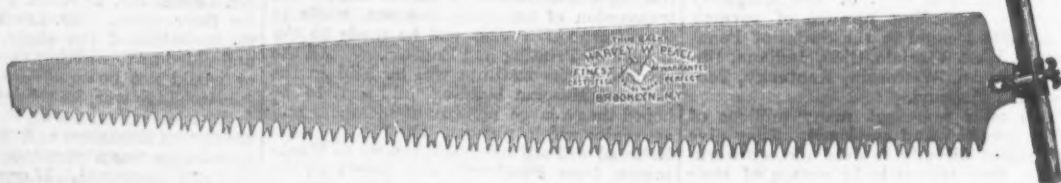
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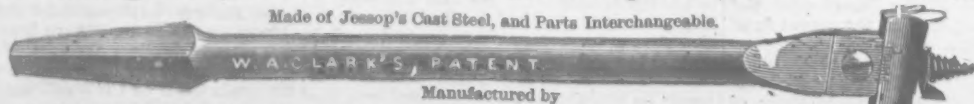
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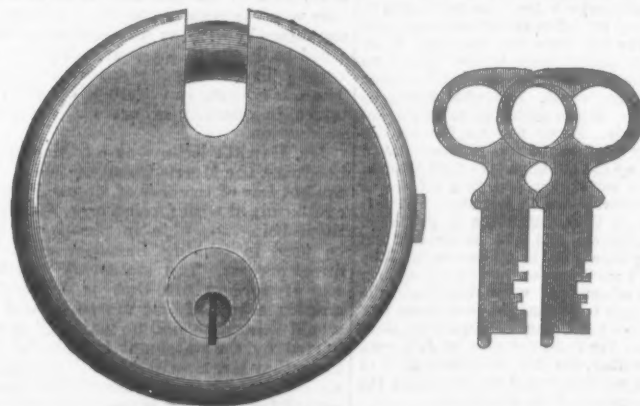
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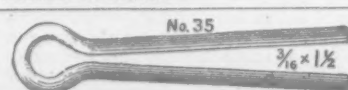
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The United States Standard Screw Thread.

On May 16th, 1868, the United States Navy Department adopted as a standard pitch, depth and form of screw thread, what is known as the United States standard thread. Since that time much effort has been put forth by some of the most prominent manufacturers of screw-threading tools to cause this standard to be generally accepted to the displacement of what is known as the sharp V-thread. How far these efforts have been accepted is shown by the fact that a great majority of the bolts in use still have the old form of sharp V-thread, and that this form of thread is furnished unless the purchaser specially designates that he requires the United States standard thread.

In the discussion following Mr. Stetson's paper on "The Standard Sizes of Screw Threads," which was read before the first annual meeting of the American Society of Mechanical Engineers, held at New York in November, 1880, Mr. Stetson said: "Perhaps 80 per cent. of the taps and dies which we (the Morse Twist Drill and Machine Co.) sell are sharp threaded, and if we should fill orders with the flat top and bottom thread (i. e., the United States standard), you could imagine the number of letters we should receive requesting us to send proper tools and not those flat top and bottom things. The ignorance of people in regard to this is extraordinary." It certainly is extraordinary,

The first is obtained by dividing the depth of a sharp thread having sides at an angle of 55° to each other, into six equal parts, taking off one of these parts at the top and at the bottom, and joining the sides by an arc of a circle whose center is on the second line of division. The second is obtained by dividing the depth of a sharp V-thread, having sides at an angle of 60° one to the other, into eight equal divisions, and cutting off one of these divisions at the top and one at the bottom so as to leave a flat place at the top and bottom, and it is apparent to the eye that the straight sides of the United States standard thread are the longest. No reason is given for assuming that the curves of the round top and bottom thread do not have contact, while practice demonstrates the direct contrary to be the case, as will be shown presently. Assuming, however, for the present, that such curves do not have contact, then the United States standard has the extra length, due to its slightly increased depth, which is shown in Fig. 2, as well as that due to the absence of the curve. In Fig. 2 there is shown at A the United States standard thread in comparison with the common V-thread on a large scale, while at B it is shown laid above a round top and bottom thread so as to compare the thread depths. The difference in this respect, it will be observed, is too small to be of practical consequence so far as the bearing area of the thread is concerned, and attention may be confined to length of thread

commended, on account of the difficulties with which its accurate production in the first instance is attended."

Referring to the first part of this paragraph, it is true that as the corners of the flat top and bottom thread wear they become more rounded, and degenerate toward the curve of the rounded thread, but that the words "other forms to which the same objection applies with equal or greater force," apply to the other forms that were considered by the committee (as for example, the Briggs form and the Pusey, Jones & Co. form), and not to the rounded top and bottom thread, is evidenced. From the case, however, with which the Sellers thread can be originated, practical mechanic would accept it throughout had the pitches been made more in accordance with the practical requirements, even though the theoretical requirements were less rigidly filled.

The committee state that "as in every instance the threads now in use are stronger than the bolts, it became a question whether a finer scale would not be an advantage. It is possible that if the use of the screw thread were confined to wrought iron or brass, such a conclusion might have been reached, but as cast iron enters so largely into all engineering work, it was believed that finer threads than those in general use might not be found an improvement, particularly when it was considered that so far as the vertical height of thread and strength of bolt are concerned, the adoption of a flat top and bottom thread was

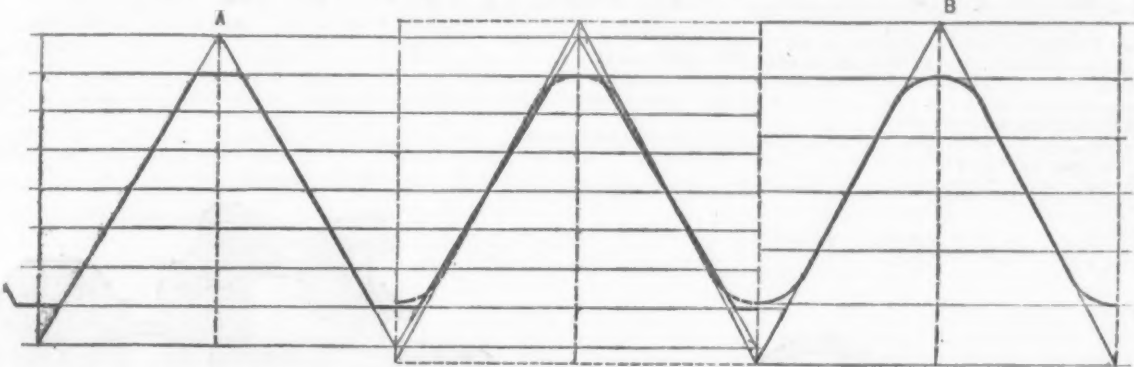


Fig. 1.—United States Standard Screw Thread Compared with the Whitworth Thread, Enlarged Sixteen Times.

considering the vast amount of effort that has been put forth by both the mechanical newspapers and by the various societies, such as the Master Car Builders' Association, the Railroad Master Mechanics' Association, and other similar bodies. But many of those who are well informed, or may reasonably be supposed to be well informed, upon the question, have not adopted the United States standard thread. Thus, Halls' Sons still use the Whitworth or English form of thread, having a round top and bottom, with the sides of the thread at an angle of 55°, while Hoopes & Townsend have adopted a thread having an angle of 52°, and if we mistake not, even the Morse Twist Drill and Machine Co. make many threading tools having the Whitworth thread. R. Hoe & Co. also use the Whitworth thread. In seeking a cause for this state of affairs, many practical facts may be found which tend to explain it. Some well-known mechanics who have had very extensive experience in the matter, express the opinion that a round top and bottom is superior to a flat one for a screw thread. Indeed, this seems to be generally admitted, notwithstanding that a flat top and bottom thread can be readily originated, whereas the origination of a round top and bottom thread is an operation requiring the most skillful manipulation. The rounded thread leaves the bolt the strongest and the cutting tools preserve these cutting edges better.

On the other hand, the flat top and bottom thread may be cut with a single pointed tool that can be made with care by an ordinary mechanic. The value of the two forms of thread may not be properly com-

pared by a comparison of a set of Whitworth threading tools made by Whitworth himself, because it is a demonstrable fact that Whitworth's threading tools are not either of so desirable a form, so well made or so true to diameter as those made by first-class American manufacturers. To initiate a thorough comparison, the tools should be alike in form and one as carefully made as the other. The committee appointed by the Franklin Institute to investigate this subject, and which first adopted the Sellers thread as a standard, stated in their report that "the bearing surface of the Whitworth thread is practically limited to the straight portion of the surface, while in the Sellers (United States standard) thread, the entire surface between the flat top and bottom may be regarded as effective bearing surface. In this particular, therefore, the preference must be awarded to the Sellers thread."

It appears, then, that the conclusions of the committee are in this respect incorrect, and that if they were correct the result would be to the advantage of the rounded top and bottom thread, assuming both forms of thread to be of equal depth. The internal threads of nuts are cut by a tap, and as the thread is formed by cutting a groove that is gradually deepened until the full depth of thread is attained, it follows that the tops of the tap teeth cut continuously, while the extreme bottom point of the thread does not perform any cutting duty, providing that the diameter of the hole to be tapped is correct. As a result, the thread cut by a tap becomes of smaller full diameter, but remains of the same diameter at the root of the thread. In

equivalent to decreasing the pitch of a sharp V-thread 25 per cent., or, what is the same thing, increasing the number of threads 33 per cent. If finer threads were adopted they would require greater exactitude than at present exists in the machinery of construction, to avoid the liability of overrunning, and the wearing surface would be diminished."

No reason is given why a bolt should be stronger than its thread. In case a bolt and thread are strained to rupture, if the thread strips it may be said the nuts simply loosen. But it does not follow that the bolt would fall out, though it might gradually work out. If the bolt should break, the liability to fall out or come out would be greater, as the overhanging weight of the bolt ends would permit the two parts to become disconnected. The great majority of screw threads are applied to wrought iron, while in most brasswork fine

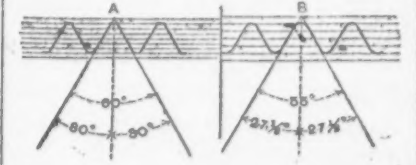


Fig. 2.—Thread of an inch bolt.—United States Standard and Whitworth.

pitches have been and are still used. As to cast iron, it is to be noted that the strength of the thread may be increased by increasing its depth, such being the actual practice, because in framing and in the other parts of machines made of cast iron, there is no objection to increasing the thread depths.

From these considerations it is thought that finer threads would make the nuts less liable to slack back, a defect that is proved to be a serious practical difficulty with present pitches, and do away with the necessity of nut-locking devices in many situations. We are now able to produce true threads of any pitch without any danger of their overrunning. The finer threads have the additional advantage that they are much easier to produce, requiring less power to produce them and causing less wear to the thread-cutting tools. The angles of the sides of all pitches of the United States standard thread being the same (60° one to the other) it follows that their sides will, if placed coincident, be portions of a straight line, as the line A B in Fig. 3 in the pitches of threads are marked down to 1/4 inch in diameter. Many good mechanics are of the opinion that these pitches would be better if finer; this is especially the case with diameters of 1/2 inch and less, on which finer threads are the rule. In screws for machine use, which are provided with slotted heads to receive a screw driver, finer threads are used, not only on account of their easier production in the screw-making machines, but also because they can be screwed more securely home.—*Mechanics.*

Design for a New Armored Ship for Coast Protection.—Capt. T. O. Selfridge, United States Navy, appeared on the 31st ult. before the sub-committee of the House Committee on Naval Affairs and exhibited and explained the drawings of an armored ship designed by him for coast and harbor defense. It differs from all existing ironclads in many particulars. It is on the circular principle as distinguished from the turret principle. Its length is to be 250 feet; breadth, 100 feet; draft, 19 feet, and its displacement 8600 tons. Its armament is to be four 70-ton guns of 15 7/10 inches diameter, with some smaller guns. The cost of such a ship without armament he estimated at \$2,500,000, and said six of them would be a perfect protection to the seaports of the country. He read to the committee a letter

from Sir Edward Reed, formerly chief naval constructor in the British Navy, approving the plans of the vessel.

The Attachment of Patents for Debt.

Perhaps no recent case in the county courts of Pennsylvania has been regarded with more general interest by the bar than the suit of Bakewell & Kerr vs. Keller, the object of which was to determine whether, under the laws of Pennsylvania, a patent can be seized and sold for debt. The plaintiffs had obtained judgment against the defendant and a writ of *fi. fa.* was returned by the sheriff indorsed "no goods." It appeared, however, that Mr. Keller was the owner of a patent for "an improvement in sand and gravel separators," an appliance used in dredging. It seemed probable that the sale of this patent would yield a sum sufficient to partially or wholly satisfy the claims of Messrs. Bakewell & Kerr, and since neither the common law nor the statutes gave them the right to attach this by any of the ordinary processes, they filed a bill in equity some time since, asking the patent to be surrendered to a receiver to be appointed by the Court, by an assignment duly executed by the defendant in accordance with the provision of a statute of the United States; this being done, the patent should be sold and the proceeds appropriately divided. It was, moreover, proposed that during these proceedings the defendant should be prevented from encumbering, transferring, selling, assigning, or disposing of the letters patent in any manner. The court readily agreed to this last provision, and issued a preliminary injunction which was recently dissolved by decree. W. K. Jennings and Geo. H. Christy represented the plaintiffs, and W. C. Erskine and D. F. Patterson the defendant. At that time no opinion was filed, and considerable curiosity has been manifested since as to the grounds on which Judge Stowe based his ruling. The opinion was not forthcoming until a few days ago, a summary of which is given.

The bill alleges that plaintiffs are creditors of the defendant, and having obtained judgment, that a *fi. fa.* was issued, to which there was a return of *nulla bona*, and that the defendant is the owner of a patent right which cannot be seized for payment of debts. The only question that has given Judge Stowe any difficulty in this case related to the jurisdiction of the court under the facts set out in the bill. He has no doubt that in England and in the courts of the United States, where there is a general equity jurisdiction, such a bill would be sustained; in Pennsylvania, however, there is no equitable jurisdiction except where it is specifically granted, and the Constitution and the various acts of Assembly must therefore be considered to determine the authority of the court. The mere refusal to apply to the payment of a debt or judgment which the law has not made the subject of seizure certainly cannot be called in any proper sense a fraud, either actual or constructive. It may be morally wrong, and even absolutely dishonest, but certainly not legally or equitably wrong under any proper definition of fraud. It seems, then, clear that no proper interpretation of the term "constructive fraud," however strained, can support the plaintiff's claim as set forth in his bill. So far as authority goes Judge Stowe has been unable to find any case where jurisdiction has been taken in such a case as this by any of the courts of the United States where there were not general chancery powers conferred by a special provision authorizing it. Creditors' bills against a debtor in his lifetime are defined to be a bill filed by creditors who seek to satisfy their debts out of some equitable estate of the defendant which is not liable to levy and sale under an execution at law, or out of some property which has been put beyond the reach of ordinary legal process. The ground in the case of a patent right is the latter. It cannot be taken and sold under an ordinary execution. It is, however, legal estate or property, and not equitable. The foundation of the jurisdiction in equity seems to be not fraud, but the general power of the court to deal with equitable property and rights. Judge Stowe further says: "It is clear plaintiff cannot sustain his bill under the act of 1836 giving Common Pleas courts jurisdiction in aid of execution; and being of opinion that the Legislature have never conferred upon the courts of this Commonwealth chancery powers in regard to such a case as is set out in plaintiff's bill, the injunction heretofore granted is dissolved."

An appeal to the Supreme Court will doubtless be taken by the plaintiff in order to settle the question beyond controversy. Judge Stowe's opinion is regarded as a very able presentation of the case, and the chances are that the Supreme Court would concur. If the decision of the lower court should be overthrown, it is highly probable that a number of suits would soon be entered against debtors owning valuable patents that cannot be seized, and a decided improvement would result in the laws for the protection of the creditor. Several States have made provision for seizing patents for debts just as any other property, either by clothing the courts with general chancery powers or by special legislative enactment, and it is reported that a movement will be made to have a similar statute in Pennsylvania.

Burning of the Carthage Furnace.—On Sunday, February 5th, the village of Carthage, N. Y., was the scene of considerable excitement, due to the burning of the Carthage Iron Company's furnace, the entire destruction of which, together with the loss of thousands of bushels of coal and the greater portion of the village, was prevented by the efficient services rendered by the local fire department. The flames were first discovered in the top house, which was completely destroyed. The origin of the fire is not known, some claiming it was caused by the ignition of the coal by sparks from the furnace. The losses, which are partially covered by insurance, range somewhere between \$5000 and \$15,000, but no definite information could be obtained. The greatest loss will probably be in shutting down the furnace, which of course must be done, as there is now no way of feeding it, owing to the destruction of the top house. The Car-

thage Iron Company will begin at once to rebuild the destroyed portions, and, if the weather permits, the furnace will again be in running order in a short time.

An Italian Torpedo Boat.

A trial of a first-class torpedo boat, built for the Italian Government by Messrs. Yarrow & Co., of Poplar, London, England, recently took place at Westminster, and was attended by highly satisfactory results. It may be stated with regard to this vessel, that its speed is the highest ever officially recorded in any vessel afloat when fully equipped. It is, moreover, provided with an arrangement by means of which, if the stoke-hole became flooded, the fire would not be extinguished—a risk to which steamers are liable, and from which many have been lost. The vessel is very similar to many already sent by Messrs. Yarrow & Co. to the Mediterranean, all of which have reached their destination in safety. There are two ejecting tubes in the bow pointing directly forward, from which the Whitehead torpedoes are discharged by compressed air, and at a slight inclination. These boats are fitted, as usual in all those constructed by the above firm, with a bow rudder in addition to the rudder aft, not only for the sake of securing rapid maneuvering power, but to obtain perfect control when going astern, the speed obtained when going astern being about seventeen knots. The power of steering rapidly is now looked upon by naval authorities as of the utmost importance, because, owing to the general adoption of machine guns on board all large war vessels, one great aim of the officer in charge of a torpedo boat will, in future, be to keep his boat pointing toward the vessel attacked, so as to present the smallest possible area to the enemy's fire, and, immediately after discharging the torpedoes, to retire with all dispatch by going astern, keeping the boat still pointed in the same direction, not steering round, which would present the entire broadside to the enemy's fire. The trial for speed was made at Long Reach a few weeks since, in the presence of Rear-Admiral Raccchia, Captain Noco, and other Italian authorities, when the mean speed obtained, the boat being fully equipped with torpedoes, torpedo gear, &c., was 22.46 knots. The new arrangement recently patented by Messrs. Yarrow & Co., for preventing the fire from being extinguished by the influx of water in the stoke-hole, was tested by the Italian authorities on another occasion, and it was clearly proved that, with the stoke-hole and boiler compartment full of water, the boat still retained its steaming power, and the experiment, which lasted two hours, was only stopped by the authorities being thoroughly satisfied with the value and success of the arrangement. In fact, the vessel could continue steaming a distance of at least forty miles, which would enable it to reach a place of safety, or give time to repair the damage. While under way, a valve was opened in the boat's side, so as to give direct communication with the water, which was allowed to run in until its level in the stoke-hole and boiler compartment was practically the same as outside, and which was of necessity considerably above the furnace bars, and under ordinary circumstances the fire would have been extinguished long before this condition could occur. It was clearly evident that the boat could steam for at least three hours without the fire requiring replenishing, which would enable it either to secure assistance or give ample time to get all the pumping arrangements to work, instead of being, as otherwise would have been the case, helplessly disabled, having no steam either to propel itself or to supply the steam pumps.

Electric Light Wires.

The question concerning the safety of buildings over the roofs of which electric-light wires have been stretched, was recently brought before the insurance men of Philadelphia. Inspector McDevitt, of the Fire Insurance Patrol, informed Aswood Smith, the president, that two electric-light cables had been stretched across Market street to Hood, Bonbright & Co.'s building above Eighth street, the connection with the line on Chestnut street being made by means of the roofs of intervening buildings and the extreme southeast corner of the Girard House block. The various insurance companies interested in the patrol were notified. The American Fire Insurance Company, 310 Walnut street, learning that the wires rested on the building occupied by Young, Smith, Field & Co., 312 Market street, on which it held policies for a large amount, sent word to the owners that unless the wires were immediately removed the insurance policies would be canceled. The insurance companies were strong in their expressions of disapproval, a majority of them being of the opinion that in case the roofs of buildings should be used in place of underground conduits, the property owners would be compelled to assume the risk of loss by fire or to pay largely increased rates of insurance. Mr. Montgomery, of the American Company, who is also a member of the Philadelphia Board of Underwriters' Committee on Electric Lighting, said that he considered the wires stretched from the Girard House to Hood, Bonbright & Co.'s building as especially dangerous to the houses over which they passed. The wires being made of copper, would sag with the weight of their length, and, in sagging, would rub against the roof of some building underneath and so cause an accident. By rubbing against an iron roof the insulating material, he thought, would soon wear off, and the next rainy day would ground the electric current with unpleasant results. In his opinion the work of stretching cables from roof to roof should be stopped.

An inventor claims to have produced a railroad switch that can be operated by levers controlled by the engineer in the cab of a locomotive, by which the switch can be successfully closed or opened when a train is running at the rate of 60 miles an hour. The lever operates on a balance-wheel between the rails opposite the switch in such manner that the shifting rails can be moved either way at the will of the engineer.

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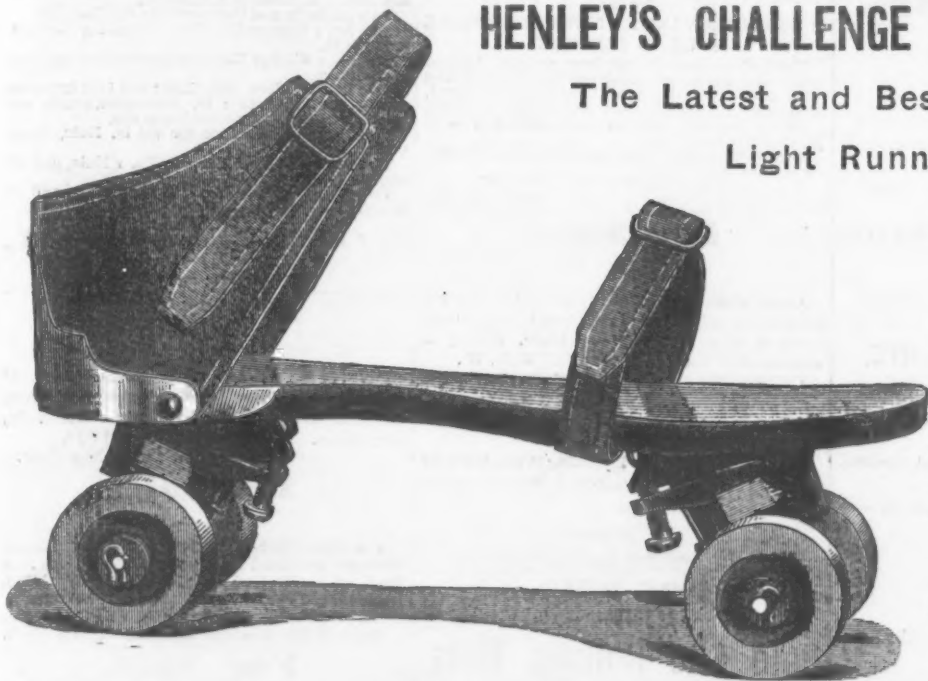
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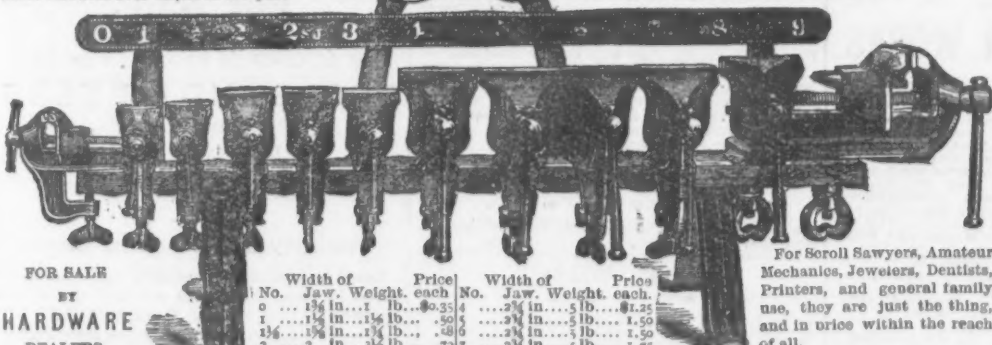
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1	1 3/4 in.	1 1/2 lb.	5	2 3/4 in.	5 1/2 lb.
2	1 7/8 in.	2 lb.	6	2 7/8 in.	6 lb.
3	2 in.	2 1/2 lb.	7	3 in.	7 lb.
4	2 1/4 in.	3 lb.	8	3 1/4 in.	8 lb.
5	2 1/2 in.	3 1/2 lb.	9	3 1/2 in.	9 lb.
6	2 3/4 in.	4 lb.	10	3 3/4 in.	10 lb.
7	2 7/8 in.	4 1/2 lb.	11	3 7/8 in.	11 lb.
8	3 in.	5 lb.	12	4 in.	12 lb.
9	3 1/4 in.	5 1/2 lb.	13	4 1/4 in.	13 lb.
10	3 1/2 in.	6 lb.	14	4 1/2 in.	14 lb.
11	3 3/4 in.	6 1/2 lb.	15	4 3/4 in.	15 lb.
12	4 in.	7 lb.	16	5 in.	16 lb.

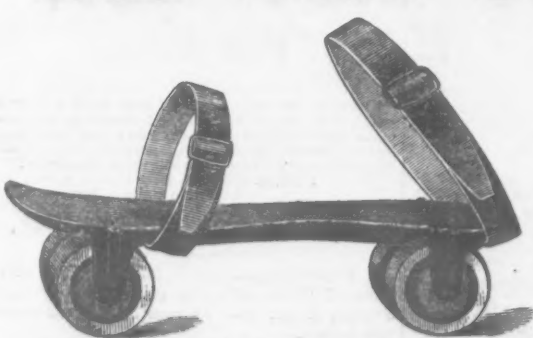
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Dr. Siemens vs. Siemens-Anderson Steel Co.

We have already noted the suit of Dr. Siemens against the Merchants' and Manufacturers' Bank, growing out of the recent failure of the Siemens-Anderson Steel Co. Judge Collier on Saturday filed an opinion on the rule to show cause why the money realized from the sheriff's sale of the personal property of the Siemens-Anderson Steel Co. should not be paid into court, holding that the executions are valid in the order of their issuing. After reciting the facts in the case, the Judge discusses the question of law involved. As the opinion is of interest to parties doing business in Pennsylvania, we give full extracts:

The counsel for the rule contend that the money realized on the execution as aforesaid, should be paid into court and distributed *pro rata* among all the creditors, and this on the ground that the defendant is an insolvent corporation. It is true that the assets of a bankrupt corporation are to be distributed equally among all the creditors *pro rata*. But upon what kind of insolvency is this predicated? Insolvency in fact or legal insolvency? In the case of an individual, the creditor may levy and sell his property until the debtor becomes legally insolvent by voluntary assignment. But does a different rule prevail as to selling the property of a private corporation, not being any part of its real estate, fixtures, franchise or plant.

The act of June 16, 1836, 72d section, directs the manner of proceeding with executions. It holds, first, that the officer shall demand the amount, with legal costs, of an officer at the principal office of the corporation; second, that personal property of the corporation sufficient to satisfy the debt can be seized if no person can be found upon whom demand can be made. The 73d section then provides that in case the execution shall be returned unsatisfied the court upon petition shall sequester the goods, &c., of the corporation, and the 74th section directs that the net proceeds shall be distributed among all its creditors as in case of insolvency of individuals. It will be seen that so long as there is tangible personal property levied upon sufficient to satisfy the plaintiff's judgment, there can be no legal insolvency. On this point the Supreme Court in 1872, in an opinion delivered by Judge Thompson, said: "A return of the *feri facias* pursuant to the 72d section of the act showing the demand without success and failure to find property liable to seizure and sale upon it, make way for the operation of the 73d section, and the creditor, upon petition, may have a writ to sequester the goods, &c." But it is thought that the act of the 7th of April, 1870, helps the contention of the counsel for the rule. The provisions of that act are that the plaintiff may issue a writ of *feri facias*, instead of applying to the court for a writ of sequestration. It only directs the judgment creditor to issue an alias *fi. fa.* instead of proceeding by sequestration. The Circuit Court of the United States held that this act did not repeal the 72d section of the act of '76. "When the execution is returned unsatisfied in whole or in part, then begins the proceedings in sequestration which the act of '70 was designed to supplant."

From these statements it seems reasonably clear. First, that the sheriff in levying upon the personal property of the defendant corporation under an ordinary *fi. fa.* has proceeded in strict accordance with the directions in the 72d section of the act. Second, that until there is a return of *nulla bona*, a return that the execution is unsatisfied in whole or in part and an alias, *fi. fa.* is issued by the plaintiff under the act of 1870, the contestants have no standing to ask distribution in this proceeding as in cases of insolvency. It follows that the rule must be discharged.

LABOR AND WAGES.

The Waverly Coal and Coke Company, near Pittsburgh, who recently entered suit against D. R. Jones, the miner's secretary and the proprietors of the *Labor Tribune*, have filed their charges. The charges are conspiracy and libel. Damages to the extent of \$20,000 are asked on the first count; that the defendants conspired to injure the business of the plaintiff, and \$50,000 is asked as compensation for injury and was occasioned by the publication of libelous articles in the *Labor Tribune* and *Commercial Gazette*. At the time of the several grievances committed by defendants the business of the Waverly Coal and Coke Company was conducted on the co-operative system, by which the miner receives one-half the price the coal sells for after deducting cost of transportation. It is claimed that the defendants incited the miners to discontent by inflammatory speeches against the co-operative system, and induced several to leave their employ, and by advertising to the public prints induced other miners to keep away from the plaintiff's works. It is further charged that the defendants aided and abetted, with money and provisions, bands of idle men to lounge around the company's works, thereby creating confusion and disorder; that threats were frequently made on the lives of such plaintiff's employees as proposed to work; that by disseminating false and libelous utterances regarding the plaintiff company and the quality of its coal, great injury was done to the complainants. Further, defendants assumed to control the market for disposal of the product of the company, and persisted in keeping up the same conspiracy and evil intent after D. R. Jones, one of the present defendants, and Hugh Anderson were convicted and punished therefor in the Westmoreland County courts. The result of the litigation will be looked for with great interest, and the array of legal talent on both sides indicates that the suit will be thoroughly contested.

The mills considered on strike by the Amalgamated Association are Zanesville and Wellsville, Ohio; W. D. Wood & Co., McKeesport; Crescent Steel Works, Pittsburgh, and the Bessemer Steel Works, Homestead, Pa. Just as long as men continue to go to work at either of these places, just so long will they aid in defeating themselves. No man with a spark of manhood will work at

either of the places named.—*Amalgamated Association*. What has become of Scottsdale and the other mills that were "on a strike!"

An iron worker complains in the *Labor Tribune* of the wrong of the two, three and four job system, "which is carried on to great or less extent in some of the rolling mills and steel works not five miles distant from our office. That is to say, a heater having two or three furnaces or a roller two, three or four trains of rolls under his charge. And this is tolerated by the association in the face of the constitution strictly forbidding it where it is practicable to enforce this law. If the association says it is not practicable to enforce it in this district they admit their weakness, and should wipe it from the constitution, and let every man take as many jobs as he can get in one mill, while other good and true men must walk the streets in idleness." The *Tribune* says of this: "The above communication is published for the purpose of giving these men a fair hearing. We, however, positively dissent from the practice of bringing such matters before the general public. It is a matter that should be settled in the lodges, and its discussion there should be free and full."

The blast furnacemen in Chicago and vicinity are out in advertisements and circulars warning their Eastern fellow craftsmen that a strike is in progress there, and for them to refuse all offers of employment from agents hailing from that section.

Workmen at the Pullman shops, near Chicago, had an indignation meeting last Saturday, the complaint being that while they have been receiving but \$2 per day, a practical reduction has been made to \$1.90 by the new order refusing them tickets to and from the city. They claim that this move on the part of the Pullman Company is to compel them to move to Pullman and live in the Company's houses, on which the rent has been raised from \$10 to \$17 per month. Numerous other complaints were made. There are 4000 to 5000 men employed at the Pullman shops more or less interested.

There was a reaction in the building business last fall at Pittsburgh, and masons and stonecutters were subjected to a reduction in wages, which they now wish to restore to the rates generally ruling last season. There are 700 stonecutters in the two cities of Pittsburgh and Allegheny. Ordinary mason's wages are \$2.25 to \$2.50, and those more skilled receive from \$2.75 to \$3.75. The experts, of which there are nearly a hundred, for fine work receive from \$4 to \$5. The demand of the cutters now is an increase of 50 cents per day all around.

The North of England Board of Arbitration have granted the ironworkers 7 1/2 per cent. increase of wages. The representatives of the latter expressed their satisfaction, and hoped a strike would be averted.

The coal miners at Savanna, Ind. Ter., are on a strike against a reduction of 1 cent a bushel for digging.

Sheffield Trade With America.

The United States Consul at Sheffield has completed his return of exports of goods from the Sheffield district for the month ending December 31. It shows a total of £1,462,057, as compared with £1,075,242 for 1880. It will be noticed that although there is a considerable increase on the month of December, there is a falling off in steel as compared with the corresponding month of 1880, though there is an almost equally marked increase in the value of cutlery. For the quarter there is a decrease in both steel and cutlery as compared with the corresponding quarter of 1880, although, as we have said, the gross increase is large (£63,511). The returns for the last quarter of 1881, with the totals for the corresponding quarter of 1880, are as follows:

	Steel.	Cutlery.	Total.
1881.	£ s. d.	£ s. d.	£ s. d.
October...	27,740 9 8	23,713 7 8 1/2	77,756 1 9 1/2
November...	31,467 19 11	20,587 11 5	58,849 11 3
December...	29,414 15 6	25,731 5 0	58,571 18 9
	£86,621 20 5	£70,031 13 13 1/2	£244,077 13 9 1/2
1880.	£ s. d.	£ s. d.	£ s. d.
October...	23,900 3 0	25,177 0 1	58,779 0 8
November...	31,418 3 8	25,068 7 7	58,499 3 8
December...	36,453 17 1	21,815 8 4 1/2	77,337 8 10 1/2
	£91,771 3 9	£72,061 17 4 1/2	£241,458 13 3 1/2

The figures for each month of 1881 are as follows:

	Steel.	Cutlery.	Total Exports.
1881.	£ s. d.	£ s. d.	£ s. d.
January...	18,781 4 10	21,242 1 3	51,281 2 8
February...	24,418 14 4	23,740 4 0	59,681 7 1
March...	33,159 17 3	28,054 2 3 1/2	79,611 15 7 1/2
April...	38,156 1 7	14,700 7 9 1/2	117,443 17 11 1/2
May...	30,103 3 7	18,789 4 9 1/2	131,329 19 3
June...	31,663 19 8	21,020 2 1 1/2	131,795 13 11 1/2
July...	26,212 5 7	27,038 14 5	93,303 9 2
August...	19,884 12 10	28,182 0 7 1/2	120,769 10 5
September...	31,663 13 3	25,778 13 8 1/2	134,417 4 10 1/2
October...	27,740 9 8	23,713 7 8 1/2	77,756 1 9 1/2
November...	31,467 19 11	20,587 11 5	58,849 11 3
December...	29,414 15 6	25,731 5 0	58,571 18 9
	£291,137 6 6 1/2	£241,458 13 3 1/2	£532,646 0 10

The return for 1881 is the largest since 1873, and has been exceeded by only two years—1873 and 1872. In the latter year Sheffield trade with the United States touched its highest point (£1,734,628). In 1873 it was £1,659,773; in 1874, £1,263,048; in 1875, £691,232; in 1876, £475,666; in 1877, £470,594; in 1878 (the lowest point ever reached), £429,016; in 1879, £671,723; in 1880 the value bounded up to £1,075,242; and now in 1881 to £1,462,057.

The question of the liability of a patent right to be sold by the sheriff under proceedings for debt, was lately decided by the Supreme Court of the District of Columbia and the Supreme Court of California. Both decisions are to the effect that although an ordinary sheriff's sale of a debtor's patent right would be good for nothing, a court of equity, when proper supplementary proceedings have been taken, may compel the debtor to make an assignment of the patent for the benefit of his creditors, and in default of such assignment within reasonable time, may appoint a trustee with power to execute the assignment.

In Reimann's process for rendering cloth water-proof, the fabric is passed slowly by machinery through a tank divided into three compartments, the first containing a warm solution of lead acetate, and the third pure water, which is constantly renewed. The cloth on passing from the latter is brushed and beaten to remove the salt adhering to the surface, and finally hot pressed and finished. In this case lead sulphate is deposited on the fibers.

Loesch Albert
Chains, case, 1
Lyles & Gilson
Springs, 200, 1
Merchants' Dis. Co.
Pneumatic machine,
case, 1
Mason J. W. & Co.
Cases, 5
McCoy & Saunders
Cases, 20
Moore's Sons J. P.
Cases, 10
Moss F. W.
Files, cks., 3
Rogers Henry
Cases, 32
Seville Mfg. Co.
Packages, 26
Scott W. P.
Cases, 4
Schwering, Daly &
Gates, 8
Taylor Thomas
Cases, 1
U. S. Electric Lighting Co.
Packages, 4
Vanderbilt W. K.
Iron ware, cks., 22
Wieland, Hilder & Co.
Hardware and Cut-
lery, cks., 30
Witte John G. & Bro.
Cutlery, cks., 1

Iron.
Brown Bros. & Co.
Bars, 4458
Bundles, 20
Colls, 1150
Carey & Moen,
Wire rods, bbls., 337
Coddington T. B. & Co.
Sheet iron, bbls., 359
Sheet iron, bbls., 98
Duval H. R.
Forgings, 250
Elliot, Son & Co.
Ore, kg., 200,000
Lundberg Gustav
Bars, 4028
Irwin Richard & Co.
Fig. tons, 100
Latasa F.
Ore, tons, 200
Naylor, Benson & Co.
Bundles, 312
Bars, 321
Ogden & Wallace
Bars, 3693
Parker A. B.
Rods, bbls., 65
Perkins & Choate
Boxes, 50
Pim, Forwood & Co.
Bundles, 66
Tilghen L. G. & Co.
Wire, coils, 371
Whitney, A. R.
Bars T-iron, 183
Williamson Jas. & Co.
Fig. tons, 200
Order.
Fig. tons, 200
Old rails, tons, 1014 1/2
Scrap, lbs., 487,700
Scrap, tons, 120
Sheet iron, bbls., 400
Ore, tons, 1832
Old iron, kg., 274,822

COAL.

The Anthracite Coal trade is remarkably quiet. Said one of the largest operators yesterday, "This weather is raising the mischief with us," all previous calculations having miscarried on account of the unseasonable warmth. Next week is the last one under the half-time arrangement for a restriction of production, but from present indications it will be renewed. It is not denied that even now there is more or less cutting of prices in the smaller sizes of Coal, though the demand for Lump, Steamboat and Broken, according to papers published in the mining region, is sufficiently active to take up all of these descriptions now produced. An improvement is hardly expected before the spring rates are fixed and the programme announced for the new year, which ordinarily takes place about March 1st. Demands for the Pennsylvania iron furnaces are represented as being quite active. Confidence is felt that new routes of transportation will soon open large markets in the West.

The Bituminous trade is temporarily blocked on account of uncertainty arising from labor agitations, as between the Cumberland and Clearfield regions. A meeting to be held in Baltimore to-day of all the representatives concerned, to consider the question of a reduction of wages in the Cumberland region to correspond with rates received by miners in the Clearfield region, will probably be decisive. The price of Bituminous Coal alongside in New York is \$5.15 @ \$5.25, and the rate of freight from Baltimore to Hoboken is \$1.45; Gas Coal to New York, \$1.55.

Eastern freights are \$1.50 to Boston and \$1 to Providence, but the amount of business doing around the Cape is nominal. The total amount of Anthracite mined for the year is 2,124,943 tons, against 1,960,024 tons for the same period last year. The total amount of Bituminous mined for the year is 396,015 tons, against 205,096 tons for the corresponding period last year.

OLD METALS, PAPER STOCK, &c.

The purchasing prices offered by dealers are as follows:

Copper, heavy	100 lb.	\$10.16
" light	"	" 10.14
Copper Bottoms	"	" 10.14
Yellow Metal	"	" 10.10
Brass, heavy	"	" 12.12
Brass, light	"	" 10.10
Composition, heavy	"	" 15.16
Lead, heavy	"	" 10.16
Tea Lead	"	" 10.14
Zinc	"	" 10.14
Pewter, No. 1	"	" 13.16
Pewter, No. 2	"	" 12.16
Wrought Iron	25.00	26.00
Light do.	12.00	13.00
Stove Plate	13.00	14.00
Machinery do.	15.00	17.00
Grate Bars	7.10	8.00
Electrotype plates	10.00	11.00
Stereotype plates	10.00	11.00
Small type	10.00	11.00

The prices current (prices paid by local dealers) for Rags, &c., are as follows:

Canvas, Linen	100 lb.	\$3.00 @ 4.00
White Cotton, New	"	" 3.00 @ 4.00
" Old	"	" 2.00 @ 3.00
White, No. 1	"	" 4.00 @ 4.50
No. 2	"	" 3.00 @ 3.50
Seconda	"	" 1.00 @ 1.50
Soft Woollens	"	" 1.00 @ 1.50
Mixed Rags	"	" 1.00 @ 1.50
Gunny Bagging	"	" 1.00 @ 1.50
Jute Butte	"	" 1.00 @ 1.50
Kentucky Bagging	"	" 1.00 @ 1.50
Book Stock	"	" 2.00 @ 2.50
Newspapers	"	" 1.00 @ 1.50
Waste Paper and Scraps	"	" 1.00 @ 1.50
Kentucky Bale Rope	"	" 1.00 @ 1.50

PHILADELPHIA.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, Feb. 11, 1882.

Pig Iron.—Since date of our last report the market has been very quiet, and it is becoming evident to furnacemen that consumers are not prepared to pay the extreme rates recently demanded. Most of the large concerns are receiving No. 1 Iron, contracted for some time ago at about \$24 to \$24.50 at furnace, and they show no anxiety to increase their engagements, particularly if it involves any advance in cost. It is reasonably certain, therefore, that the attempt to advance prices to \$25.50, or even \$25 at furnace, is likely to prove a failure, except in the case of two or three very choice brands. Forge Iron sympathizes to some extent, and sellers can be found at probably 50¢ per ton below prices asked a few weeks ago. The supply is not large, and consumption is fully maintained, but buyers have got the impression that prices will be no higher, and for that reason are inclined to postpone purchases until they are in actual need of replenishment. Sales have been made to a moderate extent, but only small lots are taken unless concessions are granted. A 500-ton lot of Chickies No. 1 was taken at \$26.50, delivered at Philadelphia, and good Lehigh brands command \$26 @ \$26.50 for same delivery; No. 2 is rather quiet, and \$23 @ \$23.50 at furnace are considered full prices, and \$22.50 @ \$23 for Gray Forge.

The change in the tone of the market is due to several influences, the most potent one probably being the unfavorable advices from abroad. There is a general softening in values, not only in Pig Iron, but in old material, as well as in Finished Iron. With many persons it has become customary to attach the idea of something very serious to the outlook if there is the least weakness in prices. Others appear to have no confidence unless prices are constantly quoted strong and advancing. In the present case, at all events, we think such an opinion would be erroneous. The outlook is perfectly healthy, and the change of front purely of a defensive character. The weakening in prices in foreign Iron might result in considerable unloading, unless our prices were made to correspond. The decline in breadstuffs is another important feature to be considered. Freight to the United States have been unusually high, because return cargoes were scarce, owing to the high prices of grain. There has been a decline of 10¢ to 12¢ per bushel in wheat within a very recent period, and there is every reason to believe that freights this way will be lower, somewhat in proportion to the improvement in return cargoes. This may not be felt immediately, but there is little doubt that the tendency will be toward easier rates, and, in fact, foreign Iron is already offered at lower prices, based to a great extent, on anticipations of this character. It would be as unwise as it would be impossible for this market to offer any substantial support to the English market, so that the only alternative is to let prices down so that there is nothing to be gained by purchasing any but domestic Iron. So far as regards our own markets, everything is satisfactory; consumption large and likely to remain so, but, as we intimated last week, "whatever change there may be will be due to causes outside of the American Iron trade." On the whole, the outlook indicates a tendency toward lower prices, although the demand during the next three months is likely to be sufficiently large to prevent any very serious decline. The controlling influence, however, will undoubtedly be from outside sources.

Foreign Iron.—Bessemer is weak and irregular, with very little demand for large lots. Sales have been made at \$26 for parcels of 2000 to 3000 tons each, but it would be difficult to move larger lots unless at further concessions. Sellers are figuring on lower freights, so that on the whole buyers find the market in their favor. Offers of \$26 for prompt shipments have not been accepted, but for later deliveries there would be very little difficulty in placing orders. Spiegeleisen is in demand, but it is difficult to place orders at less than \$4.1, although latest transactions were at \$3.25. Stocks are said to be light, and holders are firm at \$4.1. Mid-diesboro' Iron is held at \$21.50 @ \$22 in store, and lots of 100 or 200 tons are taken at these rates. Fresh shipments would cost about \$22.50, but there is no disposition to buy. A 1700-ton lot in store is reported closed at \$21, but there is some doubt as to the exact figures.

Muck Bars.—The demand has fallen off considerably, and prices are lower. Prices are irregular and difficult to quote, but there are sellers at \$45.50 @ \$46, although some ask \$46.50 @ \$47.

Blooms.—The market is quiet, but prices are steady and unchanged, viz: Charcoal Blooms, \$75; Run-out Anthracite, \$62.50 @ \$65; Scrap Blooms, \$55, and Northern Ore Blooms, \$50.

Bar Iron.—There is very little change to report in this department. The demand is satisfactory, and manufacturers can secure all the business they require at about 2.8¢ for Refined Iron. There is not so much appearance of scarcity as there was some time ago, and the market may be called easier, although fairly steady at quoted rates. The amount of work on hand is becoming reduced, however, and there is a disposition to enter orders at present quotations, the prospect of higher prices being somewhat remote. For the time being there is no room for complaint, either as to demand or price, and it is hoped that the near approach of the usual spring trade will prevent anything like weakness in prices. For the best Refined Iron 2.8¢ @ 2.9¢ is quoted from mill, and 3¢ from store.

Structural Iron.—The market has been very quiet during the past week, and, although manufacturers have a good deal of work under way, prices incline toward weakness. Small lots from store are held at former prices, but large buyers can probably place orders at combination prices—say 3.7¢ for Beams and 3.9¢ for Channels. Angles are quoted, 3.1¢ @ 3.25¢, according to specification.

Plate and Tank Iron.—There is no improvement to notice, the demand being unusually light. There is still work enough on hand to keep the mills busy for some time to

come, but the absence of inquiry is rather discouraging, and buyers could undoubtedly place orders on better terms to-day than at any time within the past three months. This may be only temporary, but sellers are keeping a sharp lookout for business, and it is probable that prices will be shaded if a desirable order comes on the market. In the meantime small lots command about as follows: Tank Iron, 3.5¢; Refined, 3.75¢; Shell, 4¢; Flange, 5.25¢ @ 5.50¢, and Fire-box at 6.25¢ @ 6.50¢. Skelp Iron has sold at about 3.1¢ to the extent of 1500 tons.

Sheet Iron.—The demand is remarkable, and manufacturers are almost as crowded as during the busy season. There is no change in prices, and orders are taken at about the following quotations, with the usual concessions to large buyers, viz:

Common Sheet, No. 27 and 28	5 1/2¢
Common Sheet, No. 26	5 1/2¢
Common Sheet, No. 25	5 1/2¢
Common Sheet, No. 24	5 1/2¢
Common Sheet, No. 23	5 1/2¢
Common Sheet, No. 22	5 1/2¢
Common Sheet, No. 21	5 1/2¢
Common Sheet, No. 20	5 1/2¢
Common Sheet, No. 19	5 1/2¢
Common Sheet, No. 18	5 1/2¢
Common Sheet, No. 17	5 1/2¢
Common Sheet, No. 16	5 1/2¢
Common Sheet, No. 15	5 1/2¢
Common Sheet, No. 14	5 1/2¢
Common Sheet, No. 13	5 1/2¢
Common Sheet, No. 12	5 1/2¢
Common Sheet, No. 11	5 1/2¢
Common Sheet, No. 10	5 1/2¢
Common Sheet, No. 9	5 1/2¢
Common Sheet, No. 8	5 1/2¢
Common Sheet, No. 7	5 1/2¢
Common Sheet, No. 6	5 1/2¢
Common Sheet, No. 5	5 1/2¢
Common Sheet, No. 4	5 1/2¢
Common Sheet, No. 3	5 1/2¢
Common Sheet, No. 2	5 1/2¢
Common Sheet, No. 1	5 1/2¢

Wrought Iron Pipe.—There is no change in quotations, say 37 1/2¢ discount for Boiler Tubes, and 55 @ 57 1/2¢ for Gas and Steam Pipe.

Steel Rails.—It is difficult to quote prices with accuracy, as much depends upon time and place of delivery, size of order, terms of payment, &c. There is no doubt, however, as to the fact of prices being lower, so that \$55 offered by a good buyer would be likely to find ready takers. Buyers appear somewhat uncertain what course to take, and there is not the same urgency to place orders as prevailed a year ago, notwithstanding the fact that prices are about 5¢ per ton lower. Indications favor the impression that railway building and renewals will not be equal to last year, although by keeping out foreign Rails there may be sufficient work to give full employment to all the American mills. There is no room for foreign rails, however, and the reductions in prices have been made with a view of meeting contingencies of this kind. Quotations are nominally \$56 @ \$58 at mill, but, as stated, lower prices would be accepted for large lots.

Steel Blooms.—There is some inquiry, but the views of buyers and sellers are wide apart. For lots duty paid \$46.50 is asked, or about \$6. 12 1/2¢, c. i. f., but neither offer seems to induce business.

Iron Rails.—There is nothing doing except in very small lots. Light sections command \$50 @ \$52; heavy, \$48 @ \$48.50; but we hear of no important transactions.

Railway Fastenings.—Spikes are quiet, and prices a trifle easier. Large orders could probably be placed at about 3¢—smaller lots, 3 1/2¢ to 3 1/4¢.

Old Rails.—The market has again fallen into a condition of inactivity, and it would be difficult to dispose of large lots unless at lower rates. Lots of 100 to 300 tons for spot delivery would probably command about \$31, but it would be difficult to sell large lots at over \$30, if at that. The largest consumers are pretty well supplied, and not disposed to increase their holdings, hence the market is unsettled and weak. Spot lots are scarce, however, and a few hundred tons could probably be placed at \$31 for Tees—or \$32 @ \$32.50 for Doubles.

Crop Ends.—Are offered at \$27.50, but there appears to be no demand at present.

Scrap Iron.—The market is somewhat quiet, and buyers are very careful in their selections. Foreign may be quoted \$31.50 @ \$32.50, and choice No. 1 American, \$33.50 @ \$34.50. Cast quiet at about \$22.

Nails.—Continue in light supply, and are firmly held at \$3.40 as the lowest wholesale price.

PITTSBURGH.

[By Telegraph.]

PITTSBURGH, PA., February 11, 1882.

The Western Iron Manufacturers' Association held a meeting in this city to-day, and after reaffirming the existing card, adjourned until the first Wednesday in April.

Office of The Iron Age, 27 Fourth Avenue, PITTSBURGH, PA., Feb. 11, 1882.

Quietness has been the order of the day in the general Iron trade during the past week, and while there is less activity in the raw article, there appears to be no falling off in the demand for the products, and the mills still have about all they can do. However, while the demand for the former has fallen off for the present, there is no decline in the consumption, which is up to the fullest capacity. Every puddling furnace is employed and producers generally are by no means discouraged, and the indications are that there will be no immediate change in prices one way or the other. Had the Western Iron Association, at its last meeting, advanced prices for the products, an attempt would, no doubt, have been made ere this by furnacemen to obtain more money for the raw article, but in view of the action of the Iron Association, all effort in that direction has been abandoned, apparently, for the time being. The fact of the matter is the trade generally, both producers and consumers, are disposed to pursue a conservative policy; and while, as might be expected, they would like to have better prices, they are apprehensive of foreign competition. The outlook at the present time warrants the belief that the Iron trade of 1882 will be fully equal to that of 1881, but with the largely increased capacity it is believed that our home manufacturers will be able to meet the demand, and that with the exception possibly of Steel Rails, buyers will be spared the necessity of sending orders across the ocean. In a word, the trade here and throughout the West are on the alert; some of them have not fully recovered from the bad effects of the disastrous boom of two years ago, and they are determined, if possible, to prevent a repetition of the same.

Pig Iron.—The situation remains substantially the same as a week ago; business continues very quiet, the demand has fallen off very materially, and while prices are still maintained, the tone of the market is easier.

Some consumers, in view of the lull of the past two weeks, are beginning to think that possibly prices may go back slightly, but these are in the minority. There are good and satisfactory reasons for the lull, reference to which was made in our report of last week. The most prominent of these is that large blocks of Pig Iron, bought some time ago, when prices were considerably lower than at present, and kept back by the railway blockade, are now coming forward, and consumers appear disposed to use this before buying more. The receipts have been unusually large for several weeks in succession, but nearly all of that coming forward is going in on former contracts; hence, while consumers are better supplied, there is no accumulation in sale yards. Good Neutral Forge Iron may be quoted at \$25.50 @ \$26, 4 mos.; Cinder Mixture, Red-short incline, \$26.50; Foundry Grades, \$25.50 @ \$28, 4 mos., according to quality; Bessemer, \$29 @ \$30—sale, 200 tons at \$29, cash.

Muck Bar.—The market is less active and weaker, and it looks as if slight concessions might be made in order to effect sales. There is considerable offering and the arrivals are large, and as buyers generally are impressed with the belief that lower prices are near at hand, they are holding off, keeping themselves in position to take advantage of a decline, should it take place. The purchases of Muck Bar during the past few months have been much larger than ever before by Pittsburgh mill owners. For this there were various reasons. Some of them were using more than they could make, while others bought it for less money than they could make it, and it would appear that some of the old-time bar mills were enabled to do better in selling Muck Bar than by working it up into Finished Iron. We are cognizant of several mills that have been working exclusively on Muck since last fall. The latest sales reported were at \$45 @ \$46, cash, but there are now but few buyers for good Neutral at over \$45, and some refuse to pay above \$44.50.

Manufactured Iron.—The general position of the market remains much the same as last week. Manufacturers still report business active, and that the turning away of orders is still of common occurrence. Prices are very firm at full card rates, and an advance could doubtless be maintained, for a time at least, but, for reasons to which reference has already been made, manufacturers have refused to put up rates. There is to be an adjourned meeting of the Western Iron Association to-morrow. We repeat former quotations: Bars, 2.50¢ rates; Sheet, on a basis of 4.30¢ for No. 24; Tank, 3.30¢; Boiler Plate, 5 1/2¢ @ 7 1/2¢, according to brand. The demand for Skelp Iron has fallen off considerably and prices are easier. We now quote at 3¢, against sales about the close of the year at 3.15¢ @ 3.25¢. Skelp Iron, as is well known, is a specialty, and therefore not affected by the regular iron card; manufacturers are free to do as they see proper.

Nails.—There has been no change in the situation during the past week; business keeps up well, and it is expected that within the next few weeks large orders will be on the market, as it is about time for the spring trade to open. Prices remain unchanged, \$3.40, 60 days, with an abatement of 10¢ per keg on carload lots, and 2¢ off for cash.

Wrought Iron Pipe.—The demand continues light, as compared with what it was some time ago, but the mills still have about all they can do; some of them are still engaged on old orders, while others are anxious to work up an assorted stock for the spring trade. Discounts on Gas and Steam Pipe remain unchanged, at 55 @ 57 1/2¢; on Boiler Tubes, 37 1/2¢ @ 40¢. Oil-well Casing, 55¢ per foot, net; Tubing, 25¢, net.

Rails.—The Steel Rail market here, as elsewhere, is easier, and while the mills are sold several months ahead of their production, we hear of offers to sell for summer delivery at lower prices; we are cognizant of one offer, direct, to sell for the delivery in question at \$58, cash, free on board in Pittsburgh. Railway Spikes remain unchanged, at \$3.15 per keg, 30 days, for round lots, and \$3.25 in a jobbing way. Splice Bars, \$2.70 @ \$2.80, and Track Bolts, \$4 @ \$4.25.

Steel.—There is a continued good degree of activity, and the outlook was never better for an active spring and summer trade. Best brands of refined Cast Steel, 12¢; hammered Cast Steel, 2 inch and under, 8 1/2¢; machinery Steel, ordinary sizes, 3/8 to 2 inches round, 8¢; Spring Cast Steel, 7 1/2¢; Crucible Steel, in slabs, 6 1/2¢; Solid Safe Cast Steel, 8¢; Bessemer and Open-hearth Spring Steel, 5 1/2¢; ditto Plow, 5 1/2¢; best brands of Steel Boiler Plate, 6 1/2¢ @ 7¢, according to size of order and time of delivery.

Bessemer Blooms and Billets.—Are still quoted all the way from \$55 @ \$75 per ton, according to carbon.

Scrap.—Wrought Scrap is quoted at \$33 @ \$35 per net ton, the outside figure for selected Railroad; Car Axles and Springs, \$38 @ \$40; Wrought Turnings, \$22 @ \$23; Old Car Wheels, \$30 @ \$32 per gross ton; Crop Ends, \$31 @ \$31.50; Cast Borings, \$16 @ \$17.

Coke.—The situation remains about as noted a week ago; the volume of business is large and would be much larger were it not for the impossibility of getting the necessary transportation, which is a most important matter in the Coke trade. No change in prices, \$1.75 per ton, free on cars at ovens, and \$1.90 @ \$2 for small foundry orders.

Coal.—This important Pittsburgh interest continues in an unsatisfactory condition; the down river markets are all overstocked and very dull, and prices are low in consequence. It is claimed that at Cincinnati and New Orleans, Coal is being sold for less than actual cost.

Window Glass.—Trade over for the season; no change in card or discounts.

CHICAGO.

Office of The Iron Age, 36 and 38 Clark Street, cor. Lake Street, CHICAGO, Feb. 11, 1882.

Pig Iron.—We have no change to report in this market, with the exception of a slightly increased demand. Quotations continue firm, as follows: Lake Superior Charcoal, Nos. 1 and 2, \$31 @ \$32; No. 3, \$33; Nos. 4, 5 and 6, \$34 @ \$36. Calumet, \$28 @ \$29; Silvery Soft, \$26 @ \$27; Crane, No. 1, \$29; No. 2, \$28.50; Thomas, \$28.50

@ \$30; Imported Scotch, \$30 @ \$31, and American Scotch, \$27 @ \$30.

Manufactured Iron.—The demand continues active and prices very firm. We quote: Bar, 3¢; Angle, 4¢; T, 4 1/2¢; Beams and Channels, 4 1/2¢ @ 4 1/2¢; Hoop at 3.80¢ rates. Sheet, Plate and Tank, which latter is very scarce, as follows: 10 to 14 gauge, 4¢; 15 to 17 ditto, 4.30¢; 18 to 21 ditto, 4.60¢; 22 to 24 ditto, 4.80¢; 25 and 26 ditto, 5¢, and 27 ditto, 5.20¢. Patent Cold-rolled Shifting, dis. 20¢; Norway Iron, Original Bars, 5¢ rates; Norway Iron, re-rolled, 5 1/2¢ rates; Ulster Iron, 4 1/2¢ rates; Low Moor Iron, 8¢ rates; Nuts and Washers, 7 1/2¢ off list; Wrought Boat Spikes, 4¢ rates.

Nails.—The demand for Nails continues active, and the market is firm at prices quoted: \$3.45 per keg for 10d. to 60d. for carload lots, and \$3.55 for smaller orders, with the usual discount off.

Steel.—Tool Machinery and Agricultural Steel has undergone no change and the quotations given are firmly adhered to; we quote: Tool, 12¢; Machinery, O. H., 5 1/2¢; Crucible Machinery, 7¢; Hammer, 2 inches and under, 8¢; over 2 inches, 9¢; Cast Spring, 7¢, and O. H. Spring, Tire and Sleigh Shoe, 5¢. Sheet, first, second and third quality, 12¢, 10 1/2¢ and 8 1/2¢, respectively; Crucible Plow, 6 1/4¢; Eagle Plow, 5 1/2¢; Iron Center Plow, 10 1/4¢, and soft Steel Center Plow, 10 1/2¢.

Scrap Iron.—This market shows no change from our last writing, remaining unsettled and demand dull. We quote (dealers' purchasing prices): No. 1 Wrought Scrap, \$24, net ton; No. 1 Railroad Scrap, \$23 @ \$29; ditto Heavy Cast, \$19; ditto Stove Plate, \$14; ditto Cast Iron Borings, \$8 @ \$9, and ditto Machine Shop Turnings, \$12 @ \$13.

CHATTANOOGA.

Office of The Iron Age, Market and 8th Sts., CHATTANOOGA, Feb. 11, 1882.

The trade in heavy materials in this district was never steadier than now. The Iron trade has not perceptibly felt the effect of the slight financial flurry in New York. The weather continues extremely unfavorable to the movement of material, and transactions are considerably curtailed by the impassable condition of the country roads.

Pig Iron.—There is no change in rates. We hear of enlargements of capacity and projects for new plants, almost daily, in some part of the district. Several of the old furnaces on the Cumberland, in the brown hematite region, are being enlarged and modernized to meet the heavy demand for Car Wheel and Boiler Metal. We quote: No. 1 Foundry, \$25 @ \$27; No. 2 Foundry, \$22 @ \$24; Gray Forge, \$20 @ \$21; White and Mottled, \$19 @ \$20; Car-wheel Metal, \$38 @ \$40.

Ores.—We quote: 50¢ Brown Hematite, \$2 ton, \$2 @ \$2.75; Red Fossil, \$2 @ \$2.25, delivered at furnace.

Miscellaneous Articles.—Old Rails are strong at \$20, the supply being smaller than the demand. Scraps are in fair supply and steady at last quotations. Wrought Scrap, \$24 @ \$27; Cast Scrap, \$14 @ \$17; Old Wheels, \$29 @ \$31.

Nails.—The nail market continues very steady and prices rule strong at \$3.40 rates. The supply in the hands of dealers and mills is lighter than ever known at this season of the year. The demand is entirely from consumers, there being no speculative movement in them.

Manufactured Iron.—The good effect of the conservative action of the Western Iron Association in retaining the December card has been apparent here. Bar is steady at \$2.75 rates, with plenty of orders in hand to keep the mills busy for three months. We quote: Railroad Spikes, \$3.30; Track Bolts, \$4.25; Fish Plate, \$3.

Coal.—One or two small mines producing only grate Coals in Alabama have closed on account of the small demand. The warm weather has not been good for big prices, and those who started with Lump at \$5 in November have not maintained their prices. We quote Fancy Lump, \$4, and Common, \$3 @ \$3.75.

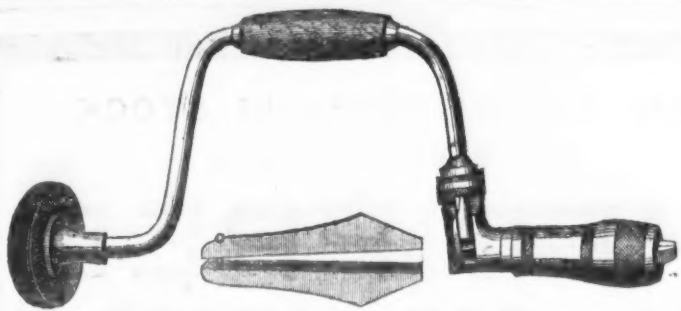
Coke.—Furnace Coke, \$3 at point of consumption; Foundry, 10¢ @ 12¢ per bushel.

Steel and Iron Rails.—There is very little demand for Iron Bars. Here and there small lots are required for renewals, but the interest is rapidly becoming a nominal one. We quote: Steel, \$60 at mill; Iron, \$45 @ \$49; Small T, \$55 @ \$57.

BOSTON.

FEBRUARY 11.—The demand for Pig Iron has not been large and the market has presented a quiet but firm appearance. There is no pressing inquiry for Iron and but little is being offered, and the furnaces are reported to be delivering most of their output on contract. The demand and supply appear to be evenly balanced at present and the market is likely to rule steady for some time. The furnace capacity has been increased somewhat and will be able to meet any demand which will be put upon it. It is not, however, thought probable that the consumption will be larger this year than last, as the railroad construction for 1882 will certainly not be larger than for 1881. Prices at shipping ports for American Pig are \$26.50 @ \$27.50 for No. 1 X; \$25 @ 25.50 for No. 2 X, and \$24 for Gray Forge. Small spot lots command \$2 @ \$3 per ton above these quotations. The market for foreign Iron is firm but very quiet, as buyers are not inclined to pay the prices demanded by sellers. Very little stock is held here and the indications point to very small importations for some time as ocean freights continue scarce and high.

We quote Eglington at \$24 @ \$25 for moderate-sized lots; Langdon, \$27 @ \$28; Gartscharrie, \$26.50; Carnbroe, \$25 @ \$25.50; Glengarnock, \$25 @ \$26; Clarence No. 3, \$22 @ \$23; Shotts, \$27.50. Old Rails.—The demand is small but the market is firm at \$32 for American. Manufactured Iron.—The demand for Manufactured Iron is still large and active, though Sheet Iron is somewhat slow. Horse Shoes are in excellent demand at from \$1.75 @ \$1.85. Nails are in steady request and firm. Bar Iron.—The demand continues very active and prices are firm. The stocks in the hands of brokers are in a



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After having made almost every kind of a Bit Brace and tried them on the market, we find that our BARBER IMPROVED BRACE, as seen in this Cut, is the only one which gives universal satisfaction. During the past six months we have made some slight changes on this Brace, which remove all objections to it and make it absolutely perfect. We are aware that other Braces are sold at a less price, but they are also made at a less cost. Everything which goes into the Barber Brace is of the best and most expensive quality, and one of them will outlast six of any other kind. The Sweeps and Jaws are of steel, the Head of lignumvite and Revolving Handle of rosewood. It is highly polished and heavily nickel plated. The Jaws will hold, without any fitting, Tool Shanks of every shape, including Round Twist Drills. When furnished with the Ratchet Attachment, for boring in places where the Sweep cannot be revolved, it is the only Brace which will answer that purpose. We have not changed the price for many years, and do not anticipate any change in the near future; but from year to year we have been adding to the quality so as to make the cost to us double what it was ten years ago. We have recently added to our manufacturing facilities, and are now prepared to supply the world with Braces.

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No. 10—14-inch Sweep, per dozen...\$33.00	No. 14—6-inch Sweep, per dozen...\$21.00
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No. 12—10-inch Sweep, per dozen... 27.00	No. 32—10-inch Sweep, per dozen... 36.00
No. 13—8-inch Sweep, per dozen... 24.00	No. 33—8-inch Sweep, per dozen... 33.00

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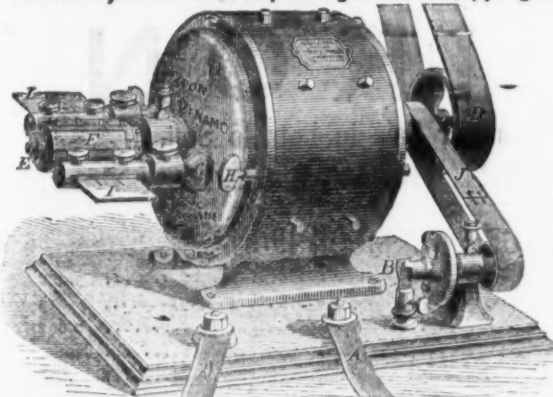
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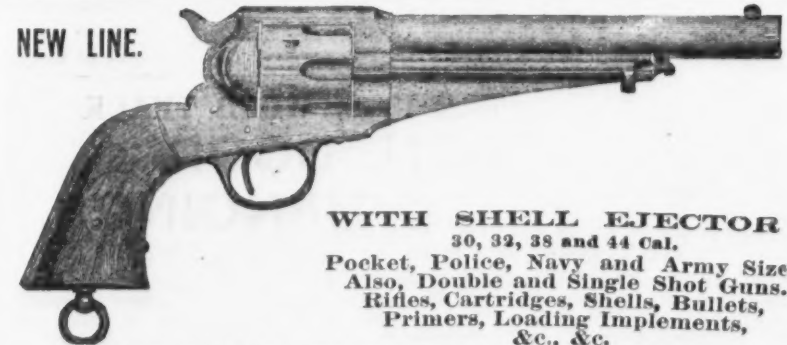


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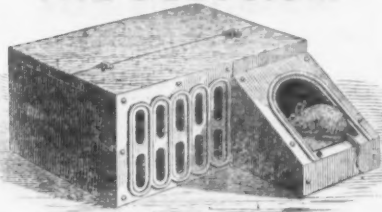


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The Best and Cheapest in Use.
DIRECTIONS.—Tack the carpet at one side of the room, then go to the other side, and with the Stretcher draw the carpet into place, leaving the spur a few inches from the base-board. Take up the slack in the carpet under the spur and drive the spur gently into the floor; it will hold the carpet in place while you drive the tacks. Manufactured by
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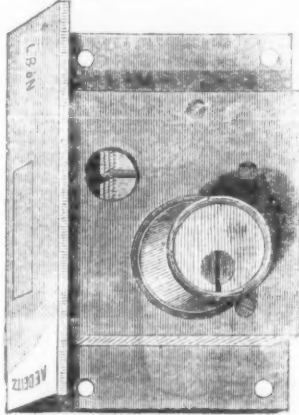
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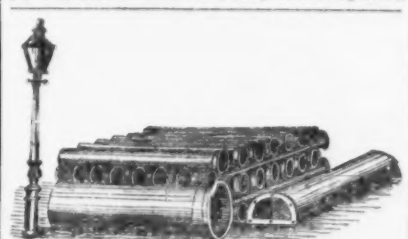
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ESTABLISHED IN 1839.

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HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST
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Our blast furnaces have sold their output for several months ahead. Prices of Rhenish-Westphalian brands have undergone no change, but I hear that the Luxembourg-Lorraine Puddle Pig combination does not want to sell any further for the third quarter at 50 francs per ton. In the rolling mill branch the good demand has been kept up. Thick Sheets for vessels and boilers are in pressing request. Quite a business is further more transacting in thin Sheets, Merchant Iron, special ditto and drawn wire; most of the works are provided with orders for these goods for several months to come. But the greatest run of orders continues to be on the Bessemer Steel department. Many orders have to be filled for iron sleepers and all sorts of small iron goods and hardware. Bolt makers have got a fair share, and Screw manufacturers have even raised their price list 10%. An increase of work is noticeable among locomotive and car makers, although they are not yet engaged to the full extent of their capacity. The upper Italian railroads have latterly ordered in Germany 33 locomotives, of which J. A. Maffei, Munich, furnished 4. Heaschel & Son, Cassel, 12, 430 "Vulcan" Co., of Stettin, 11. The steam boiler shops and Rhenish shipyards are very busy; this together with orders from the marine shipyards insures our rolling mills heaps of commands. Furthermore, it should be mentioned that work increases at the foundries and machine shops, because at the last hour a variety of industrial branches discover that they cannot delay repairs any longer, and many have to procure a fresh outfit altogether. I quote to-day Dortmund Puddle Pig, 65 @ 70 marks; No. 1 Foundry, 77; No. 2, 72; No. 3, 67; Prime Spiegel, 85 @ 85; Dortmund Bessemer Pig, 74 @ 75; Rod Iron, 140; Beama and Corners, 150; Prime Merchant, 155; Prime Sheets, 220; No. 2 ditto, 210; thin ditto, 210 @ 215; Rolled Wire, 100; all per ton at the works. Coal—Is unaltered and moderately active. Metals—A moderate amount of activity prevails, but prices are upheld. Lead is firm; we quote: English Pig, 17 @ 17.20; ditto Sheets, 17.25 @ 17.50; German Pig, 15.50 @ 16; and Spanish, 18.20 @ 18.40. Copper is unaltered and firm. We quote Drontheim, 75; Electrolytic N. A., in bars, 88 @ 75; and Refined English Ingots, 75 @ 75. Tin is firm; Banca, 120 @ 122; Australian, 128 @ 130; English Common, 120 @ 122; and ditto Refined, 122 @ 124. Spelter is inactive. We quote Silesian, spot and to arrive, 18.25 @ 18.50 marks @ 50 kg.

HOLLAND.

(Koch & Vlierboom.)
ROTTERDAM, Jan. 24, 1882.—Tin.—Dealings during the week have been large at a guinea advance, but since yesterday the market has flattened, so that Banca has been obtainable at 68 7/8 guilders and Billiton at 68.50. Lead.—For "Stolberg" 9 1/2 guilders @ 50 kg. is now asked. Of "Emserhutte" a lot changed hands at 5.37 1/2, and at the same figure 10 tons Pirath and Xoua's brand were taken. Jan. 25.—Since the above was written both Banca and Billiton have dropped to 67.50, at which figure some business has resulted. Speculators for a rise have made great efforts to prevent the break we are now witnessing, but they have failed, and there is now every likelihood that the downward tendency will henceforward become more and more decided.

EAST INDIES.

(Schmidt, Kustermann & Co.)

PENANG, Dec. 21, 1881.—Tin.—Since our respects dated 7th instant, the market opened at \$12.00, then receded to \$11.77, but soon recovered to \$12.05 per picul in response to highly favorable advices from Europe. The increased demand was, however, of but short duration, and then dropped again to \$11.60. Receipts during the fortnight have been 9200 piculs, and sales to Europe are as much, while in the way of resales local piculs changed hands with Chinese. The stock in bazar is at present 1600 piculs. Exchange has been sustained in spite of the decline in silver. We quote 4 months' bank 3/4%.

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Issue Licenses to use the Process for the

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In the Bessemer Converter, Crucible, Siemens Martin, Puddling, Blast and Cupola Furnaces. The use of this Process improves the quality of the product, saves fuel and labor, and does not require any change in furnace or manner of working. See page 17 of The Iron Age of Oct. 25th, 1877.

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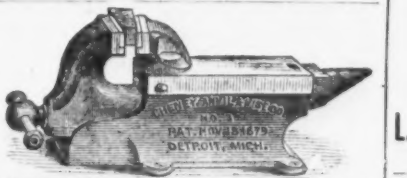
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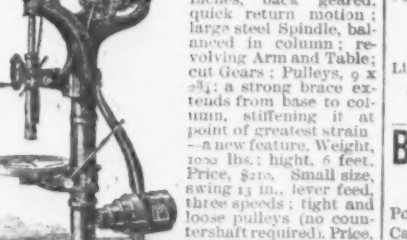
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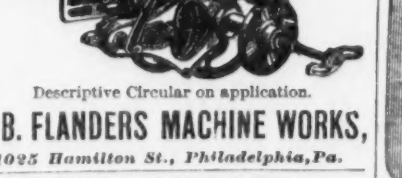
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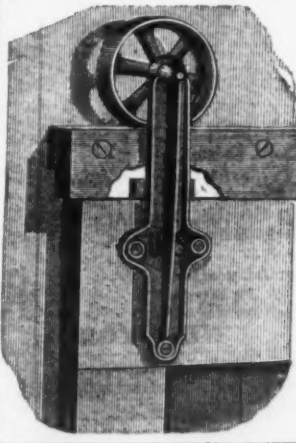
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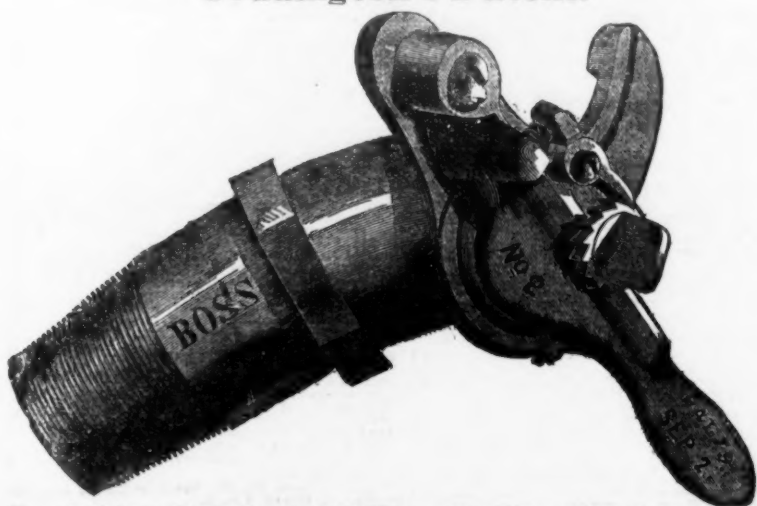
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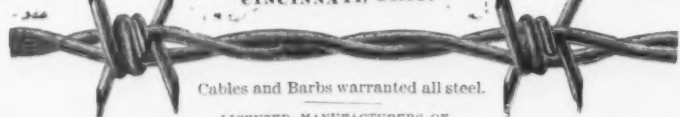
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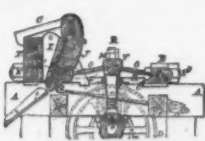
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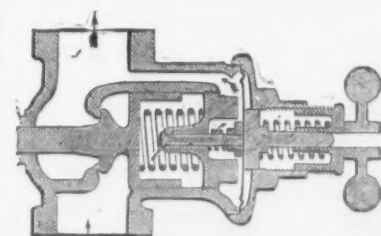


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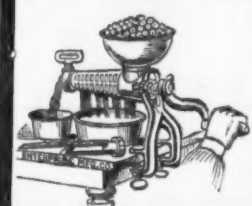

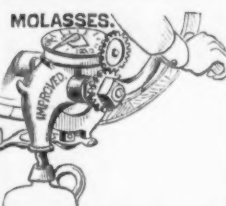
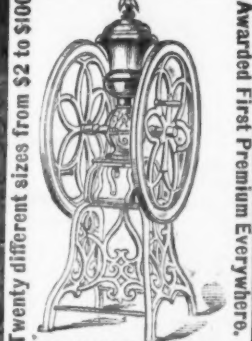

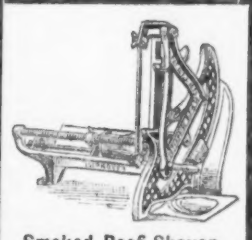

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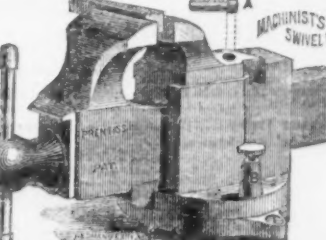
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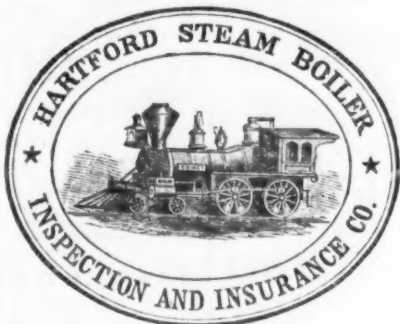
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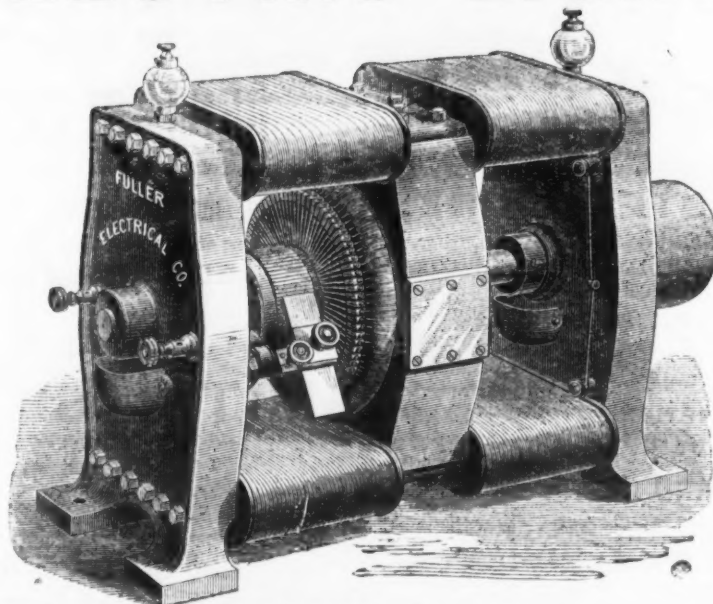
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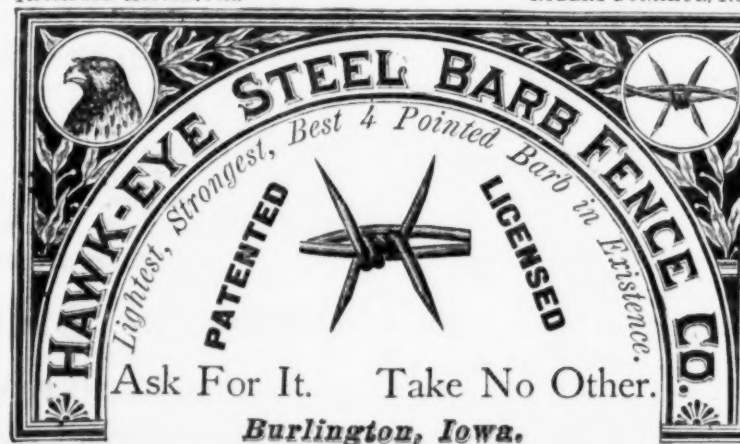
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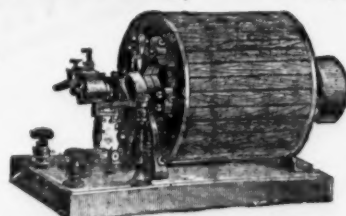
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Particular attention is paid to quality and temper for FILES, SAWS, EDGE TOOLS,
TABLE and POCKET CUTLERY, TOOLS, TAPS and DIES; also for COLD ROLLED STEEL for
CLOCK SPRINGS, CORSET CLASPS, &c.

A Large Assorted Stock of JOHN ROTHERY'S FILES always on hand.

Warranted Superior to any Steel in the Market, either
English or American, for every purpose.Also,
Combination Chrome Steel and Iron for
Safes, Jails and Deposit Vaults.Send for Circular
and
Price List.

Chrome Steel Works

Kent Avenue and Keap Street,
BROOKLYN, E. D., N. Y.Chicago Branch,
40 Dearborn Street,Cincinnati Branch,
123 Central Avenue,

JOLIET STEEL COMPANY,

MANUFACTURERS OF

Steel Rails,

ALL WEIGHTS.

The Company warrant its Rails equal in quality to any manufactured in the
United States.

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Works, Joliet, Ill.

GUTE HOFFNUNG'S HUTTE,

(Works of Good Hope.)

Established 1781.

OBERHAUSEN, ON RUHR.

8500 men employed.

BRAND:

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STEEL RAILS,

STEEL WIRE RODS,

STEEL BLOOMS,

SPIEGELEISEN,

FERROMANGANESE UP TO 80 PER CENT.

GODEFFROY & CO., Sole Agents for the United States,

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R. MUSHET'S

Special Steel

FOR

LATHES, PLANERS, &c.Turns out at least double work by increased speed
and less, and cuts harder metals than any other
Steel. Neither hardening nor tempering required.

Sole Makers,

SAMUEL OSBORN & CO.,

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Represented in the United States by

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NAYLOR & CO.,

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IMPORTERS OF

STEEL AND IRON RAILS,

Tin and Terne Plates,

Swedish and Norway Iron,

BESSEMER STEEL WIRE RODS,Pig Iron, Spiegeleisen, Ferromang-
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Iron Rails.

MANUFACTURERS OF

STEEL COMPRESSED SHAFTING,

"Benzon" Homogeneous Plates

For Boilers, Fire-boxes, &c.

Axles, Crank Pins, Spring Steel,

And all other kinds of

Martin-Siemens Steel and Iron

For Railroad purposes.

BUDD & ELLIS,

New York, 23 Cliff St. 10 Oliver St., Boston,

Sole Agents for the United States for

Langlois Scotch Pig Iron,

Commission Merchants and Dealers in

All Descriptions of Iron and Steel, Rail-
road Equipment and Supply.

Importers of

SILESIA SPelter & METALS.

Sole Agents for the United States of the Union

Co. of Dortmund, makers of Steel Rails, Blooms, &c.

THOS. FIRTH & SONS, Ltd.

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Crucible Cast Steel.

JERE. ABBOTT & CO.,

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SWEDISH IRON.

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REYNOLDS, CARTER & REYNOLDS

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Lombard Street, LONDON, E. C.

Cable Address:

REYNOLDS,

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Iron and Steel Merchants

AND

ENGINEERS.

Exporters of

Iron and Steel Rails, Blooms, Spiegeleisen,

Pig Iron, Old Rails, Scrap Iron, Iron Ore,

and all kinds of Railway Plants.

Engines and Piping for Water-
works, Mining Machinery, &c.

EMPIRE STATE MFG. CO.

BUFFALO, N. Y.

Copper,

Half Copper,

Nickel Plated

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Metal Spinning.



A. PARDEE, Hazelton, Pa. J. G. FELL, Phila.

A. PARDEE & CO.

237 South Third St.,

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MINERS AND SHIPPERS OF

Lehigh Coals.

The following superior and well-known Lehigh

Coals are mined by ourselves and firms connected

with us, viz.

A. Pardee & Co. { HAZLETON,

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CARNEGIE BROS. & CO., LIMITED,
THOS. M. CARNEGIE, Chairman. PITTSBURGH, PA. D. A. STEWART, Treasurer.

EDGAR THOMSON STEEL WORKS DEPARTMENT.

Works at Bessemer Station, P. R. R.

Branch Office and P. O. Address, 48 Fifth Ave.,

MANUFACTURERS OF

STEEL RAILS, BLOOMS & INGOTS

OF SUPERIOR QUALITY.

Union Iron Mills Department

Mills at Thirty-third St. and A. V. R. R.

Branch Office and P. O. Address, Thirty-third St.

MANUFACTURERS OF

STRUCTURAL IRON.

Bridge Iron, Iron Beams, Channel Bars, Car Truck Channels, Angles, Tees, Universal Mill Plates, Bar Iron, Light Steel and Iron Rails.

Special attention given Unusual Shapes and Sizes.

Lithographs of sections and book of detailed information giving calculation of strain, &c., furnished to Engineers and Architects on application.

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NORTH CHICAGO ROLLING MILL CO.

ESTABLISHED 1849.

CAPITAL, \$3,000,000.

INCORPORATED 1869.

Works at Chicago, Ill., and Milwaukee, Wis.

MANUFACTURERS OF

MERCHANT BAR, FISH PLATES, PIG METAL, IRON RAILS & BESSEMER STEEL RAILS.

Fish Plates.....	13,000 tons
Merchant Bar.....	40,000 "
Pig Metal.....	120,000 "
Iron Rails.....	110,000 "
Steel Rails.....	100,000 "
Total Capacity per year.....	483,000 "

OFFICES.

17 Metropolitan Block, Chicago, Ill.
37 Mitchell Block, Milwaukee, Wis.

O. W. POTTER, President, Chicago.
S. TAYLOR, Jr., Vice President, Boston.
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THE MONTOUR IRON & STEEL COMPANY.

WORKS AT DANVILLE, PA.

PIG IRON, T AND STREET RAILS.

A general assortment of mine and narrow gauge rails kept on hand, from which shipments can be made promptly.

W. E. C. COXE, President,
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THE SIEMENS-ANDERSON STEEL CO.,
Successors to ANDERSON & CO.,
Manufacturers of

Crucible Tool, Cast Spring, Cast Plow, Iron Centre, Soft Centre, and Iron Back Plow, also Open Hearth Spring, Tire, Plow, Machinery, and

ALL DESCRIPTIONS OF STEEL.

And Sole Proprietors of the Siemens Direct Process in the United States.

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THE SPANG STEEL AND IRON CO., Limited,
MANUFACTURERS OF

OPEN HEARTH STEEL,

BLOOMS, FLAT BAR, BILLETS, ANGLES, ROUNDS, AND SQUARES,

Steel for Agricultural and other Purposes.

UNIVERSAL MILL PLATES

Of Steel and Iron, up to 30 inches wide, and of any desired thickness and length.

Address, **PITTSBURGH, PA.**

THE CLEVELAND CRUCIBLE STEEL CO.
Manufacturers of
TOOL, MACHINERY, SPRING, TIRE, STEEL.
Warranted equal to any made.
CLEVELAND, OHIO.

THE PITTSBURGH BESSEMER STEEL CO. (LIMITED),

STEEL RAILS

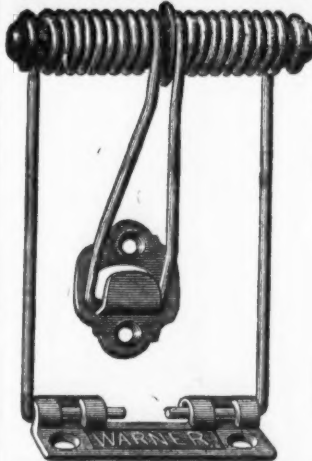
P. O. ADDRESS:

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CLEVELAND IRON ORE PAINT COMPANY,
Manufacturers of
PURE IRON ORE PAINTS,
Red (Rosie) Purple and Brown.
We guarantee all our Paints, and respectfully solicit the patronage of consumers and dealers. Send for Price List 22.
Office, 79 Columbus St., Cleveland, O.

BEST IRON PAINT.

THE "WARNER" DOOR SPRINGS



are the most simple, most effective and most convenient ever introduced, and the immense sale we are having shows their great popularity and superiority.

There never was a Spring made that is so durable, so complete in its action, operating with a uniform pressure, holding the door tight when closed, and allowing it to open without increasing the pressure at any point.

When the door is opened about 130 degrees of a circle, it will press and hold it open.

The Spring is easily unhooked and rehooked—in an instant—from the door and also from the jamb, without removing a screw or pin.

This is a Convenience Possessed by no other Spring in the Market.

We are making this season three sizes, viz:

No. 1 For Screen or Light Storm Doors.

No. 2 For Medium Doors.

No. 3 For Heavy Doors.

They are for sale by most of the prominent jobbers of the United States and Canada.

Correspondence solicited.

FREDERIC BARTLETT,
FREEPORT, ILLINOIS.

ESTABLISHED IN 1859.



PUBLISHED EVERY SATURDAY.

THE OLDEST AND CHIEF REPRESENTATIVE OF THE IRON, HARDWARE AND METAL TRADES.

OFFICE: 44a CANNON STREET, LONDON, E. C.

ADVERTISEMENTS AND SUBSCRIPTIONS ARE RECEIVED AT THE VARIOUS OFFICES OF "THE IRON AGE," NAMELY:

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SPECIAL FEATURES.

Notes of Novelties.—This is a department of the journal always watched with interest by the trade, as it contains an account, from week to week, of the novelties which manufacturers and inventors are introducing to the notice of the trade. These articles are freely illustrated. **Special Correspondents.**—The *Ironmonger* has a deserved reputation for its special correspondence from all the principal Continental, British and manufacturing centers. The writers are gentlemen holding important positions in the districts with which they are connected, and possess facilities for acquiring information specially suited for the columns of the *Ironmonger*. **The Week, Legal News, Trade Notes, Bankruptcies, Foreign Notes, Colonial Jottings, Merchants' Circulars, &c.,** are each departments of the journal containing a digest of all matters of direct interest to the Iron, Hardware and Metal Trades. In addition to the above, there is a carefully classified list of Patents, together with Editorial Notes, French, Belgian and other Special Correspondence.

SUBSCRIPTIONS

To the *Ironmonger and Metal Trades' Advertiser*, with which is sent every fourth week the Foreign Supplement (see below), may commence from any date, but are not received for less than a year complete. The rate is \$5 per annum, inclusive of postage to any part of the world outside Great Britain. To every subscriber is presented, free, in the course of his year, a handsome and useful *Ironmongers' Diary and Text Book*, a work sold to non-subscribers at 75 cents.

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SPECIAL ISSUES.

In the spring and autumn of each year there is published a Special Issue, the circulation of which is not less than Twelve Thousand (12,000) copies.

THE IRONMONGERS' DIARY AND TEXT BOOK.

This is an annual, presented free to every subscriber to the *IRONMONGER AND METAL TRADES' ADVERTISER*. It contains a large number of ruled skeleton pages for diary and other entries, and in addition much useful reference information, varied from year to year. It is handsomely bound in cloth, gilt; and as copies are used in thousands of establishments for a whole year, it is obviously a medium of exceptional value for advertisements. Sold to non-subscribers at 75 cents.

THE FOREIGN SUPPLEMENT,

With which is incorporated The Universal Engineer,

is published every fourth week in connection with the extensive and world-wide circulation of the *Ironmonger* itself. The dates of its publication for the next twelve months will be as follows:

FEBRUARY 25, MARCH 25, APRIL 22, MAY 20, JUNE 17, JULY 6, AUGUST 5, SEPTEMBER 2 and 30, OCTOBER 28, NOVEMBER 25, DECEMBER 23, 1882, and JANUARY 20, 1883.

This Supplement is published in

FOUR LEADING COMMERCIAL LANGUAGES

of the world, including English, and is sent to all the countries where they are spoken, thus placing the contents of the *Ironmonger* not only within reach but in the native language of eighty millions of German, forty-two millions of French, twenty-eight millions of Italian, and fifty-one millions of Spanish speaking people; or, in all, over two hundred millions of inhabitants in the principal nations where the best purchasers of manufactured goods are to be found.

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	13 INSERTIONS, each net.	7 INSERTIONS, each net.	3 INSERTIONS, each net.		13 INSERTIONS, each net.	7 INSERTIONS, each net.	3 INSERTIONS, each net.
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Half page.....	17.00	19.15	21.25	One-eighth page.....	6.20	7.00	7.75
One-third page.....	12.50	14.10	15.65	One-sixteenth page.....	3.20	3.40	3.60

Advertisers will do well to use illustrations freely. Where economy of space is an object, a left page illustrated and described in one language can be suitably described in four or more languages on the opposite or right page without illustrating.

THE WHOLE FOREIGN HARDWARE TRADE

so far as our experience of twenty years is concerned, will be covered by THE FOREIGN SUPPLEMENT at least twice a year. Thus a Price List of Advertisers inserted in the *Ironmonger* and *Foreign Supplement* is a strikingly powerful and most efficient way of publicity not to be compared with any of the other ordinary channels of communication.

HENRY DISSTON & SONS,

KEYSTONE SAW, TOOL, STEEL & FILE WORKS,

Front and Laurel Streets,

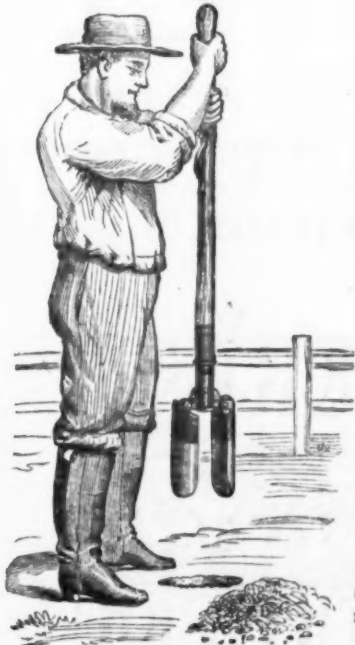
PHILADELPHIA.

DISSTON'S SAMSON TREE PLANTER AND POST HOLE DIGGER.

Fig. 1.

Patented May 20, 1870.

Fig. 2.



Price, - - - \$37.50 per dozen.

No Farmer, Nurseryman, Railroad
or Telegraph Company
SHOULD BE WITHOUT ONE.

NO BACK-ACHE.

NO KNEE-WORK.

NO CLOGGING.

This tool has been thoroughly tested, and has given the greatest satisfaction to all who have tried it. The principle on which it works makes it self-cleaning and prevents adhesion in sticky soil; therefore it always works free and easy. It is far superior to all plungers, augers and boring machines, as it works well in stony, sandy, or clay soils; quicksand under water is as easily removed as though no water existed.

DIRECTIONS.

Plunge the Digger into the ground, as shown in cut, Fig. 1, and when the soil is loosened pull out the lever with one hand, as shown in cut, Fig. 2, which will press the dirt between the blades; then draw the Digger from the hole, keeping hold of the lever with one hand and the handle with the other. When the Digger is clear of the hole, you can deposit the load anywhere within reach by simply pressing down the lever, which will open the blades and the dirt will fall from between them. The Digger is then ready for another plunge. The steel blades are nine inches long, and the whole tool five feet long. For sale at Hardware and Agricultural Stores.

HENRY DISSTON & SONS.

BROWER & LEEDS,

No. 81 Murray Street, New York.

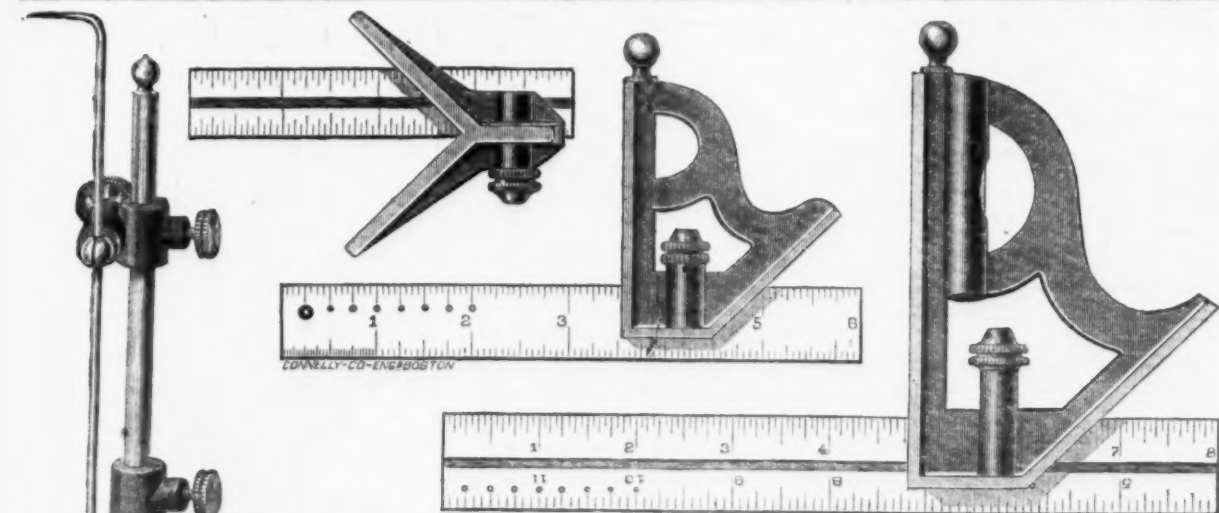
Hardware Manufacturers' Agents, and Headquarters for

HORSE SHOES, HORSE NAILS, TOE CALKS, CALKING STEEL,

Bayliss' Bellows, Forges and Tuyeres,

Horseshoers' Pincers, Sledges,

FITTING AND DRIVING HAMMERS.



Starrett's Improved
SURFACE GAUGE!

Can be quickly and accurately adjusted to lay out work for every conceivable purpose a gauge is used for.

STARRETT'S PATENT
Adjustable Square

Includes Mitre, Plumb and Level, also the best Centre Square made. One is a complete substitute for a full set of the old style squares, and warranted accurate.

L. S. STARRETT, Athol, Mass.
PATENTEE AND SOLE MANUFACTURER.

Send for Catalogue.

FRASSE & CO., Agents (P. O. Box 879), 62 Chatham St., New York.

CAUTION.

This is to inform the public that since the success of my Patent Squares has become known, unprincipled parties have had the foolhardiness to make them, under the Pretense of Chaplin's Patent. Having commenced suit against said parties, I shall soon put a stop to their manufacture, and shall hold all selling or using them responsible. Respectfully,

L. S. STARRETT.

R. P. SCOTT & CO.,
28 Orange Street, Newark, New Jersey,
Manufacturers of
ROTARY KNIFE PEACH PARERS, GOLD MEDAL APPLE
PARERS, SAFETY REVERSIBLE ICE CREEPERS, EGG
BEATERS, MELTING LADLES, &c. Also,
Scott's Peach-Pitting Machines.

CHAINS
MILLER CHAIN CO., Akron, O.
Coil, Cable, Crane, and
Agricultural Chains.

209 & 211 College St. BURLINGTON, VT.

PORTER MANUFACTURING COMPANY.

MANUFACTURERS OF

PORTER'S PATENT WINDOW & DOOR SCREEN CORNERS ETC.

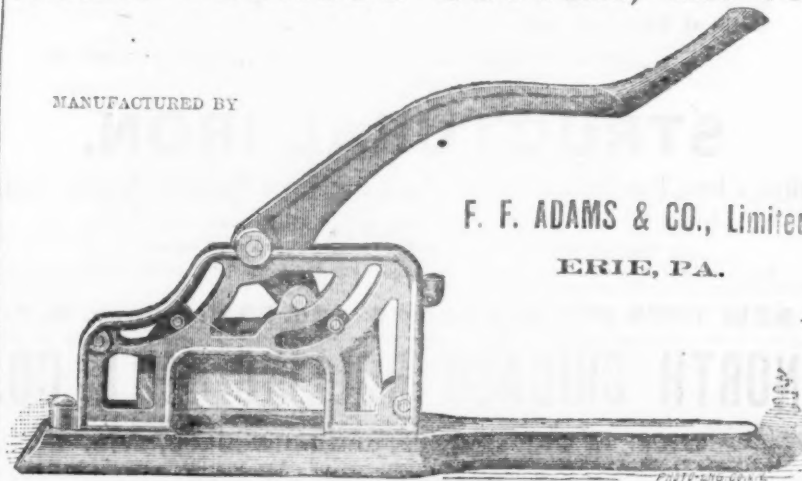
EVERY ONE HIS OWN WINDOW & DOOR SCREEN MAKER.
NO MORTISING OR TENONING, CANNOT SAG OR WARP,
AND ANYONE CAN MAKE THEM. SEND FOR PRICE LIST.

NEW YORK: GRAHAM & HAINES.
CHICAGO: W. TICKETT & SON.
115 CHAMBERS ST.
164 LAKE ST.

ACME TOBACCO CUTTER, No. 10.

MANUFACTURED BY

F. F. ADAMS & CO., Limited
ERIE, PA.



Amesbury's Band Saw Filing Machine.

Will Save Its Cost in a Few Weeks.

Any boy that can turn a crank can file a band saw in from five to ten minutes more accurately than an expert filer can do the same by hand in one hour. Keeps the teeth even and level, and enables the saw to do more and better work with much less strain. Pronounced by users to be the best labor-saving machine ever introduced.

First Premium and Diploma
of St. Louis Agricultural and Mechanical Association, 1881, awarded for
BEST BAND SAW FILING MACHINE.

Is sold at a price within the reach of very one using a band saw. Reduced price list. - Net price, including 25 files, 25: this, copy and facing files, per dozen, \$1.20; thick beveled files, per dozen, \$1.50. Terms strictly cash. Send for Catalogue and Testimonials.

G. W. AMESBURY & CO.,
325 and 327 Chestnut Street,
Philadelphia, Pa.

HENRY'S PATENT UNIVERSAL CAN OPENER.

Samples sent free for 30 cents.



The verdict of all: "The best in the market."

SCHAAL & HENRY, Factory, 3 Second St., Baltimore, Md.

THE "MOUNT CARMEL" OX SHOE.

Steel Toe Calk.

FINISHED READY FOR NAILING ON.

WARRANTED

The Best and Cheapest Shoe Made.

IVES, WOODRUFF & CO.

Manufacturers,

MOUNT CARMEL, CONN.

For sale by dealers in blacksmiths' supplies.

NOVELTY IRON FOUNDRY. HAIGHT & CLARK, 16 & 18 De Witt St., Albany, N. Y.

Manufacturers of
FINE GRAY IRON CASTINGS OF EVERY DESCRIPTION.
Rosettes and Fichets for Wire Workers, Castings for Furniture and House
Manufacturers, Iron and Metal Patterns of all kinds a specialty.
Correspondence solicited for all kinds of castings.

PURE TURKISH EMERY,

Quartz, Pumice and Rotten Stone, Crocus, Rouge, Glue, Sand
Paper, Emery Paper and Cloth, Emery Wheels, &c.

WALPOLE EMERY MILLS, Mills, No. Walpole.

NIAGARA STAMPING & TOOL CO.,

Manufacturers of
Presses, Dies and Tools for Working Sheet Metal,
FRUIT CAN AND TINNERS' TOOLS, &c.
Works, 147 and 149 Elm Street, near Clinton Street, BUFFALO, N. Y.

REMOVAL. No. 37 Warren Street, near Church St.,

Where we hope to be favored with a continuance of your generous patronage.
J. M. FARRINGTON & CO.,
Successors to DAY, FARRINGTON & CO., Manufacturers of
LOCKS, KNOBS, BONGS, BLANK KEYS,
Wrought Store Door and Flush Bolts, Silver Plated, Ornamental Bronze and other Hard ware.

PHILADELPHIA.

Corrected Weekly by Lloyd, Silliman & Walton.
 Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

ANVILS.
 Peter Wrights, & Co. 110
 Over 200 lbs. 41.50
 Eagle (American) 100 20 25

APPLE PARERS.
 Pean Apple Parer 10.50
 Rotary Apple Parer 15.50
 Lots of 10 to 25 dozen special prices.

AXES.
 Hunt's Kenton and Yankee, per doz \$10.00
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THE TRENTON ANVIL.



SOLID WROUGHT IRON, STEEL FACE (P. W. Pattern), WARRANTED.

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RAILROAD OR CANAL BARROW.

With Jacobs' Patent Wheel.



Full sized, best tray, planed and well finished. Bolted securely to frame. The legs extend upward, serving as a brace to the bowl, to which they are bolted; they are also bolted to handles. This Barrow has the Jacobs' Patent Wheel, superior in every way to any iron wheel manufactured. The wheel revolves on a fixed axle bolt, similar to a buggy wheel. The axle bolt holds the barrow firmly together. The barrow for Railroad Contractors. Will outwear any other made, and displaces all others wherever introduced. Wheel painted.

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For oiling valves and cylinders of steam engines by the only perfect method.

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The oil passes in *right*, drop by drop, into the column of steam where it vaporizes, thus becoming a *steam lubricant*, oiling perfectly every part reached by the steam.

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 Manufacturers of the
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STEAM PUMPS
For Boiler Feeding.
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 Inexpensive for Engines of all kinds.
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bine Water Wheel, Machinery and Castings
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Manufacturers of
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Send for price list, stating what you want.

BOSTON.
Reported by Macomber, Bigelow & Douse.

nvila.—"Eagle American".....	40 96¢	dls 20 ½
evil & Vise.—		
No. 1, 3, 4, 25; 2, 4, 25; 3, 3, 50 each.....		dls 25 ½
ugars & Bitts.—Snell's Auger.....		dls 40 10 ½
L'Homme dieu's Ship Auger.....		dls 15 ½

Look's Bitts.....	dis	40 1/2
Shepardson's Double-Cut Bitts.....	dis	45 1/2
Shepardson's Double Glimets.....	dis	40 1/2
Stearn's Extension Hollow Augers—		
No. 2, 1/2 doz., \$2.00; No. 3, 1/2 doz.,	dis	20 1/2
Bonney's Extension Hollow Augers.....	1/2 doz	\$3.00
Place's Bitts.....	dis	40 1/2
Graveland Bitts.....	dis	40 1/2
Blue Jackets.....	1/2 doz	\$2.00
Red Cross.....	1/2 doz	\$2.00

Double Handled Boys'.....	dis	33½ %
Double Handled. —		
Doak Extra, 31 in., No. A.....	½ doz	\$2.15
Doak Extra, 34 in., No. A.....	½ doz	2.38
Doak Extra, 31 in., No. B.....	½ doz	1.75
Doak Extra, 34 in., No. B.....	½ doz	2.00
Doak Extra, 31 or 34 in., No. C.....	½ doz	1.25
Double Clips. —		
Chattillon's.....	dis	50 %
Chattillon's.....	dis	15 to 50 %

Fast Angle (for Anti-Friction Hangers).....	¢ ft.	20	
Cast Half Round	¢ ft.	76,	36; 76, 40
Brought Round	¢ ft.	36;	36; 76, 90
Hills.—Connell's Crank Gong, reduced list.	dls	10d	10
Cases.			
Lapped M. B. & D., reduced list, 1879.	dls	40	%
Mas M. B. & D., reduced list, 1879.	dls	33½	%
Wind Fast. —Lock Fast.	¢ C sets	\$6.00	

Head Fanta.....	1/2 C sets	0.00
bed's.....	1/2 C sets	7.00
and Hinges.—Mall, Hook, 3 holes.....	1/2 C sets	7.00
and Awl Handles.—		
Phoenix Adjustable.....	1/2 doz	\$2.00
ails.—Norway Iron Carriage.....	dis 70d 5c	
common Iron Carriage.....	dis 8c	
rax.—Refined.....	1/2 lb	14c
ing Machines.—		

Angle Original each.....	\$6.50 list	dls 40k10%
Angle Angle each.....	(6.75 list)	
nell Augers.....		% set \$2.45
aces...Barber's.....	dls 40k5%	
ford's.....	dls 40k5%	
nckus'.....	dls 50k10%	
racket Saw..Holly Scroll Saw.....	each \$2.25	
emas Lath and Scroll Saw.....	each 6.90	
racket Saws, extra quality, to No. 5.....	gro 0.75	
end Frame, with patterns.....	qoz 6.99	

new Rogers, all iron.....dis 25
Bucket Saw Blades.—Griffith's pat..... $\frac{1}{2}$ gross 750
uckets.—
 B. & M. Flower Pot, reduced list.....dis 30 to 10
 Bronzed Shelf, M. B. & D., new list.....dis 50
 ore Shelf.....dis 40
its.—Union Fast Joint..... $\frac{1}{2}$ gross 10 to 10
 Union Loose Joint.....dis 45 to 10 to 10
 Looped &.....dis 80 to 80

tion Silvered Acorn.....	dis	45c	10x10
tion Boston Finish.....	dis	70c	10x10
tion Spiral Spring.....	dis	25c	10x10
rought Brass.....	dis	60c	10x10
Marriage Bolts.—Eagle Norway.....	dis	70c	8x5
Common.....	dis	80c	8x5
Marriage Jacks.—Climax No. 1.....	doz	\$2.00	
Climax No. 1½.....	doz	15.00	
Climax No. 2.....	doz	13.50	
	dis	25c	

Universal No. 1.....	each,	\$2.00	
Universal No. 2.....	each,	1.00	C
Universal No. 3.....	each,	6.00	U
Universal No. 4.....	each,	6.00	U
Universal No. 5.....	each,	6.00	U
Universal No. 6.....	each,	7.50	U
Cartridges.—U. S. Cartridge Co.....	dls 70	%	A
Paterson's make Horse & Curry.....	dls 10	%	I
Paterson's Cotton.....	dls 10	%	
Paterson's Wool.....	dls 1	%	

New List,
July, 1881.

...ers.—Bed and Table.....	dis	45	¢
...ain.—Traces 10, 4, straight.....	pair	100	¢
...aces 6 1/2, 10, 4, twisted.....	pair	550	¢
...aces 7, 12, 2, twisted.....	pair	850	¢
... 3-10.....	pair	10	¢
... 5-16.....	pair	90	¢
... 10.....	pair	60	¢
... 10.....	pair	60	¢
... 10.....	pair	60	¢

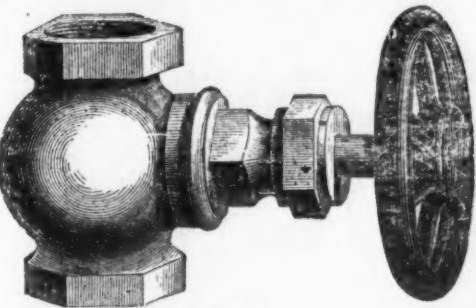
nk.—White, Carpenters.....	gross 80c	W
nk, Carpenters.....	gross 80c	B
nk, Carpenters.....	gross \$1.00	B
nk.—Hart, Bliven & Mead, Framing.....	dis 10 & 10 %	
nderhill, Framing.....	dis 25 %	W
ck's Chisels.....	dis 30 %	B
ches Line.....		B
vanized Wire, 100 feet each.....	7 doz \$4.00	W
l Hods.—"Dover."—Galvanized, New List.....	dis 50 %	W

Free Mills.—New List.....	dis	33 56 10 5	W
per Rivets.....	dis	33 56 10 5	W
Free Mills.....	dis	33 56 10 5	W
3, 3 ft. No. 6 Wire, with toggle.....	doz	4 30	G
3, 3 ft. No. 6 Wire, with snap.....	doz	4 00	W
4, 3 ft. No. 6 Wire, with toggle.....	doz	4 30	N
4, 3 ft. No. 6 Wire, with snap.....	doz	4 50	E
5, 4 ft. No. 4 Wire, with toggle.....	doz	4 75	E
5, 4 ft. No. 4 Wire, with snap.....	doz	5 00	E

6 ft. No. 3 Wire, with snap.....	doz	5.80
—Grass, L. P. & Co.	dis	40 c
—Manila, usual trade dis ic.	dis	19c
—Barr.—Cast Steel.	doz	8c
n, Steel-pointed.....	doz	6c

Butcher-Pocket, American Shear Co's.	dis 40 5
Butcher Knives, Wood's, 1/2 Doz. Boister.	dis 30 5
Square Handle.	dis 30 5
Standard.	dis 30 5
Lat. Boister, Oval Handle.	dis 30 5
Striking.	dis 30 5
Butcher, Common Round Handle, Wood's.	dis 30 5
Shoe Knives, Wood's.	dis 30 5
Dividers.-Cook's.	dis 25 5
Dog Collars.	dis 20 5
Dog Muzzles.-Automatic.	dis 15 5
Door Springs.-Torrey's Rod.	dis 10 1 52
Gem Coll, new list.	dis 14 50
Crow's.	dis 10 1 25
Door Stops.-Thurston's.	dis 10 5
Drawer Knobs.-Thurston's.	dis 10 5
Drills.-Morse Ritt Shank.	dis 15 5
Morse Straight Shank.	dis 10 5
Emery.-Wellington Mills.	dis 10 5
Emery.-Wellington Mills.	dis 10 5
Turkish in 10 cans.	dis 10 5
Enamelled Ware.-	
Standard Mfg. Co. Kettles.	dis 30 10 5
Standard Mfg. Co. Kettles.	dis 25 5
Felice Plates.-Wrought.	dis 10 5
Files.-American File Co.	dis 40 5
Nicholson File Co.	dis 40 5
Fluting Machines.-Knox list, \$4 00.	dis 20 5
American list, \$4 00.	dis 20 5
Forke-W. & Co. Manure.	dis 10 5
Gimlet Bits.-	
Genuine German, No. 125, 1-32 to 5-32, per doz.	\$1 00
Pierce's.	per doz 88
Glass Cutters.-Combination Glass Cutter and	
Grub Hoes.-K. P. & Co.'s No. 2, \$1 00.	dis 10 5
Hammer.-Wayde's.	dis 10 5
Hartford Hammer Co.	dis 10 5
Hangers & Rollers.-Anti-Friction.	dis 10 5
Hangers & Rollers.	dis 10 5
Climax.	dis 10 5
Common Hangers.	dis 10 5
Hand Screws.	dis 10 5
Hatchets.-C. P. Downer new list.	dis 10 5
Underhill.	dis 10 5
Hay Knives.-Lightning.	dis 10 5
Fisher's Patent.	dis 10 5
Reynolds.	dis 10 5
Providence Plate.	dis 10 5
Wrought Screw Hook.	dis 10 5
Hoes.-W. C. & Co.'s.	dis 10 5
Hooks and Staples.-Brewers' (new list).	dis 65 5
Horve Nails.	dis 10 5
Putnam Pointed.	dis 10 5
Horve Nails.-Bridgewater.	dis 10 5
Ice Cream Freezers.-Packer's, new list.	dis 30 5
Knobs.-Norwalk.	dis 10 5
Silver Glass Bell Pulls.	dis 50 5
Antennae.-Guarded, No. 99.	dis 10 5
Tubulars, No. 99.	dis 10 5
Triangular.	dis 10 5
Hurricane.	dis 10 5
Lawn Mowers.-The "D" Daisy.	
12 cut.	each \$2 50
14 cut.	each 3 00
16 cut.	each 3 50
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194 cut.	each 48 00
196 cut.	each 48 50
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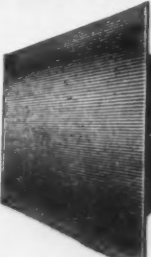

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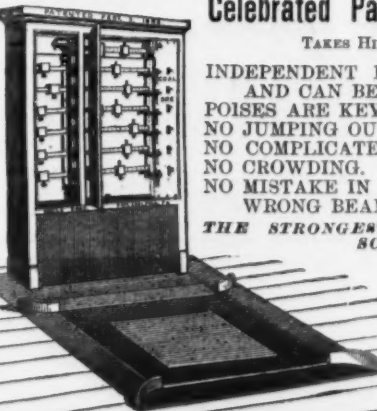

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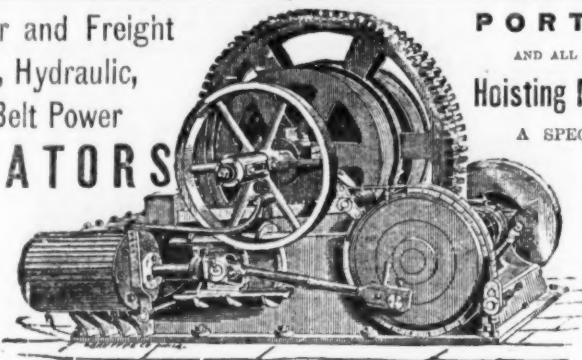


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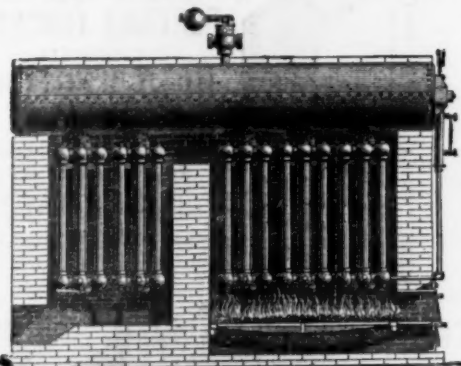
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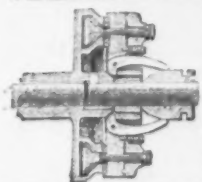
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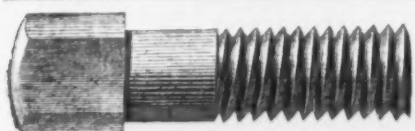
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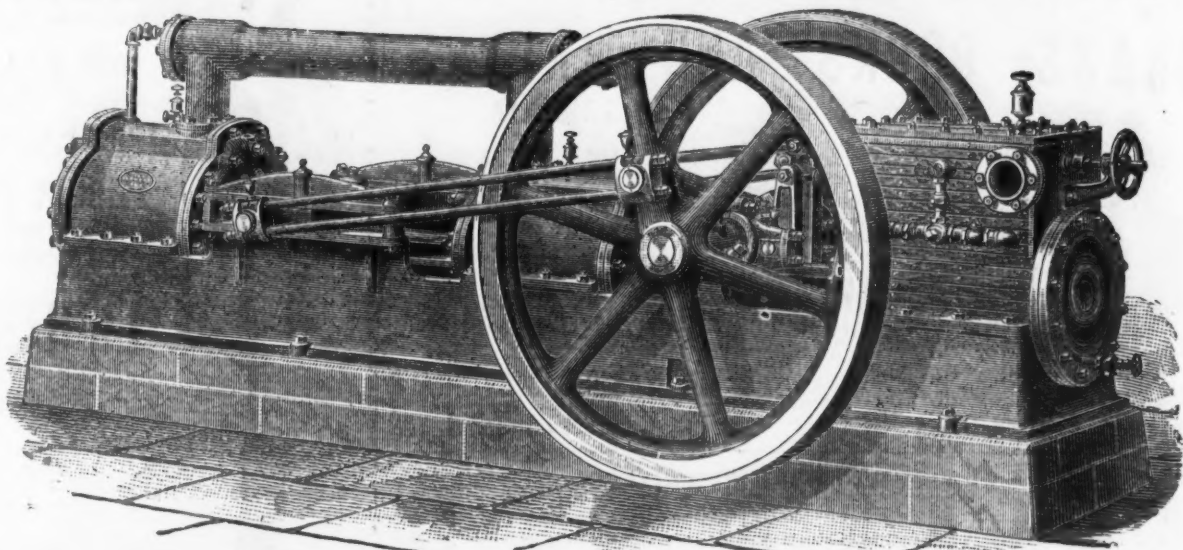
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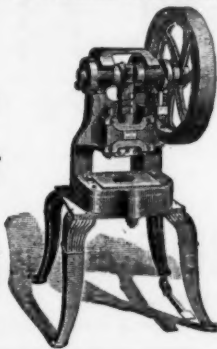


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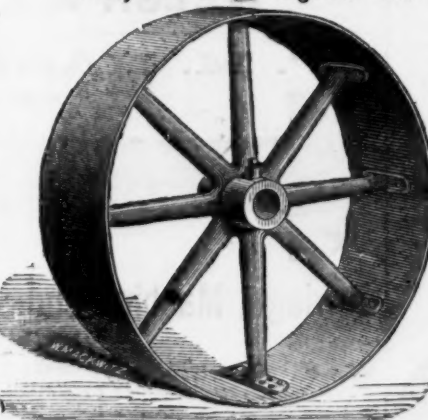
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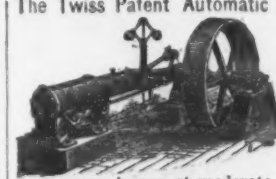
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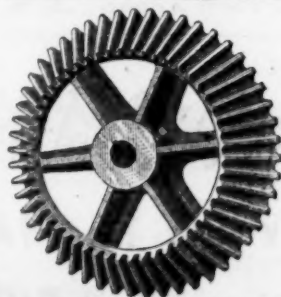
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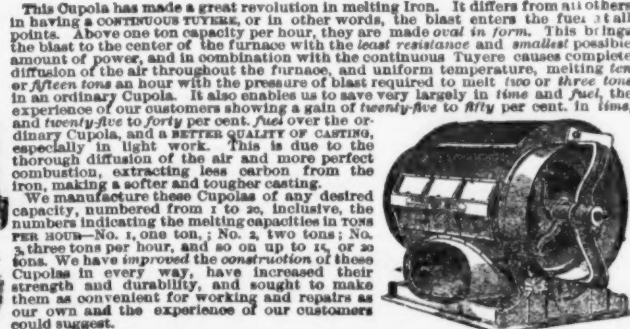
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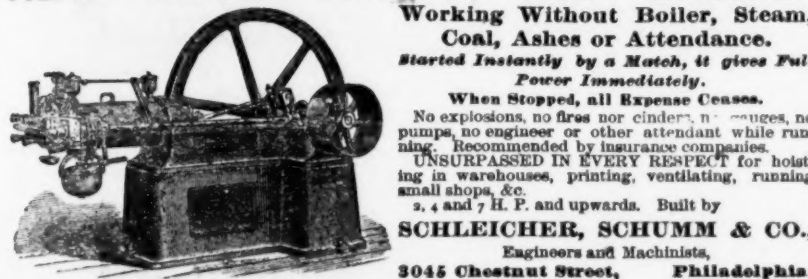
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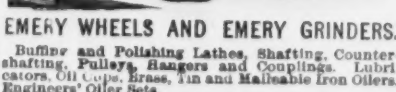
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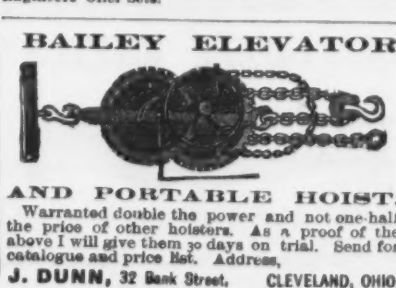
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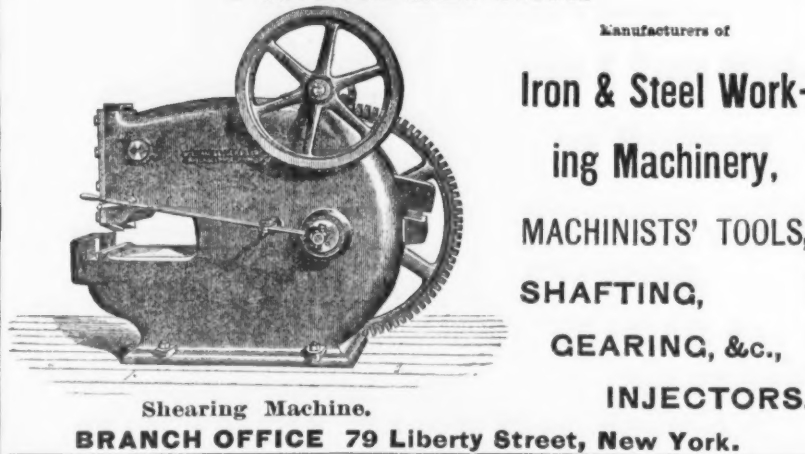
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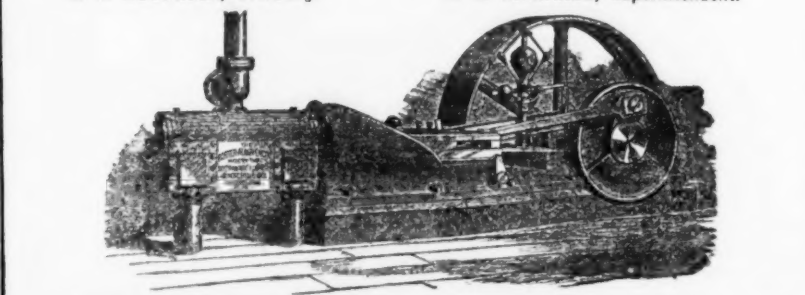
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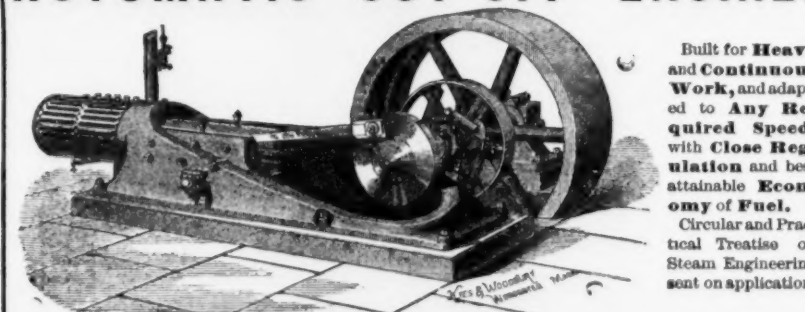
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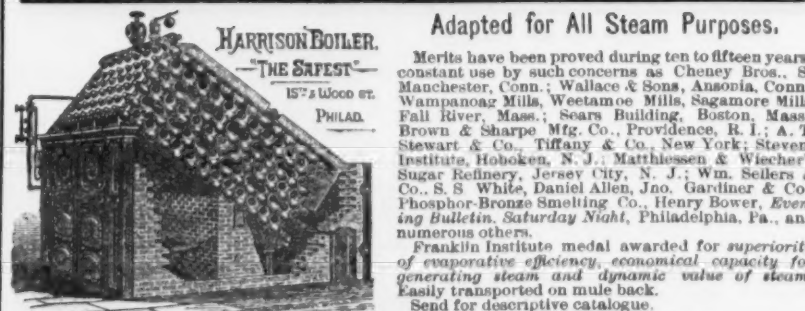
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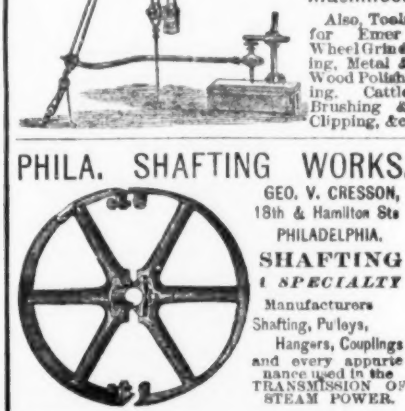
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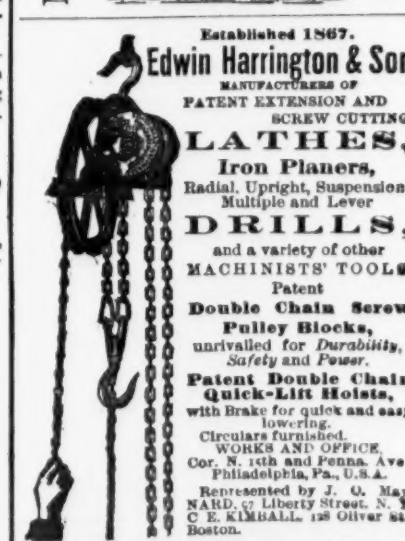
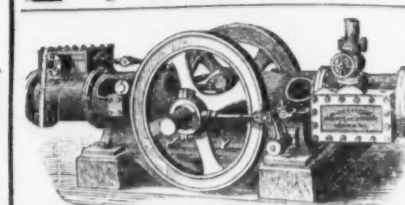
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